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THIS IS AN EXISTING SPRINT WIRELESS TELECOMMUNICATION FACILITY NETWORK VISION EQUIPMENT UPGRADE

# NETWORK VISION MMBS LAUNCH

## (LB-FUNDED) METRO PLACE

### CB33XC147

425 METRO PLACE SOUTH  
DUBLIN, OH 43017  
FRANKLIN COUNTY

LATITUDE: 40.094912° / 40° 5' 41.6832" (NAD 83) (GPS READING)  
LONGITUDE: -83.127287° / -83° 7' 38.2326" (NAD 83) (GPS READING)

89'-10" ROOFTOP PENTHOUSE MOUNT  
OHIO COLUMBUS MARKET



6550 SPRINT PARKWAY  
OVERLAND PARK, KS 66251  
PHONE: (913) 762-2000



**GENERAL DYNAMICS**  
Wireless Services

**HARPER**  
**ENGINEERING, INC.**  
TELECOM GROUP

815 Superior Ave. Suite 1514  
Cleveland, OH 44114

Phone: (216) 344-3855  
Fax: (216) 344-3856

### DRAWING REVISIONS

Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
0	For Construction	04/22/13	DWH



NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:

# TITLE SHEET

SHEET No./Rev.:

## T-1/0

SCALE: AS NOTED  
DRWN. BY: MCM  
CHK'D. BY: MAD  
Date: 02/06/13  
cad file: 12-172-065

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

BUILDING/DWELLING CODE	IBC 2009 (INTERNATIONAL BUILDING CODE) CBC 2011 (OHIO BUILDING CODE)
STRUCTURAL CODE	IBC 2009 (INTERNATIONAL BUILDING CODE) CBC 2011 (OHIO BUILDING CODE)
PLUMBING CODE	OPC 2011 (OHIO PLUMBING CODE) IPC 2009 (INTERNATIONAL PLUMBING CODE)
MECHANICAL CODE	OMC 2011 (OHIO MECHANICAL CODE) IMC 2009 (INTERNATIONAL MECHANICAL CODE)
ELECTRICAL CODE	NEC 2011 (NATIONAL ELECTRICAL CODE) NFPA 70 (NATIONAL FIRE PROTECTION ASSOC.)
FIRE/LIFE SAFETY CODE	IFC 2001 (OHIO FIRE CODE) IFC 2012 (INTERNATIONAL FIRE CODE)

### ACCESSIBILITY REQUIREMENTS:

FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS REQUIREMENTS ARE NOT REQUIRED IN ACCORDANCE WITH THE 2009 IBC BUILDING CODE.

### CODE BLOCK

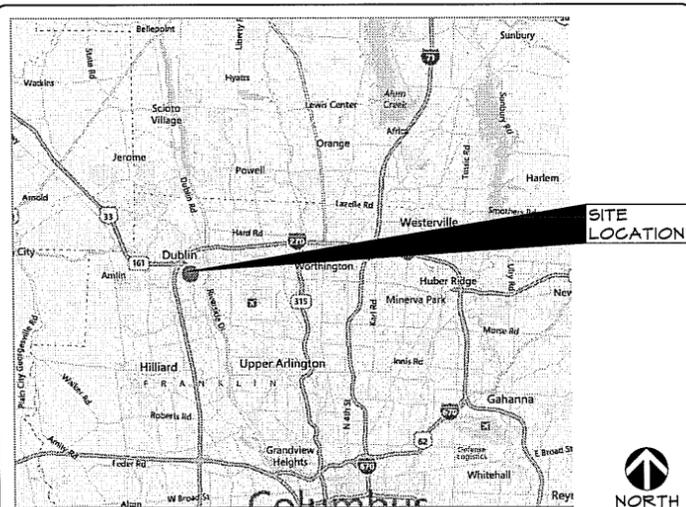
SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY

- REMOVE (3) EXISTING PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (3) NEW PANEL ANTENNAS (1 PER SECTOR)
- REMOVE (2) EXISTING EQUIPMENT CABINETS
- INSTALL (1) NEW MMBS CABINET
- INSTALL (1) NEW EBU CABINET
- REMOVE ALL EXISTING SPRINT ANTENNA COAXIAL CABLES
- INSTALL (3) NEW HYBRIFLEX FIBER OPTIC CABLES USING EXISTING COAX ROUTE (1 PER SECTOR)
- INSTALL (6) NEW RRUS

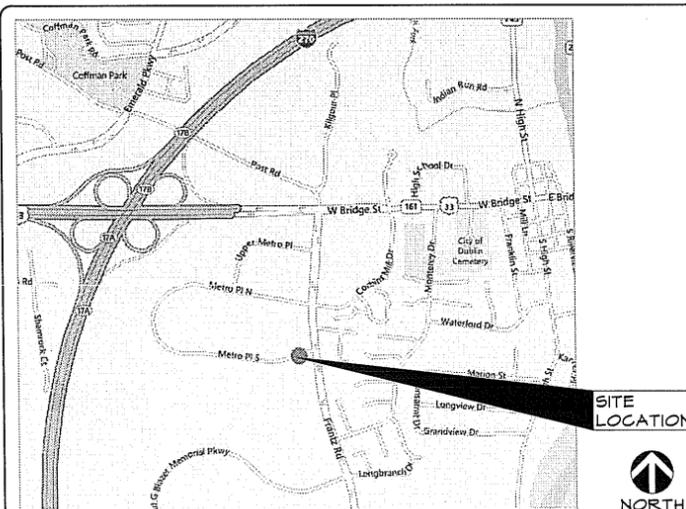
### PROJECT DESCRIPTION

APPROVAL	SIGNATURE	DATE
SITE ACQUISITION MANAGER		
CONSTRUCTION MANAGER		
A&E MANAGER		
PLANNING CONSULTANT		
RF MANAGER		
RF ENGINEER		
PROPERTY OWNER		
SPRINT REPRESENTATIVE		
AAV MANAGER		

### SIGNATURE BLOCK



AREA MAP



VICINITY MAP

Driving directions from 921 Eastwind Drive Westerville, Ohio 43081:  
Depart Eastwind Drive toward Mallway Drive. Turn left onto Huber Village Blvd. Turn left onto OH-3 S./State Street. Take ramp right for I-270 N. At exit 17A, take ramp right for OH-161 East / US-33 East toward Dublin. Turn right onto Frantz Rd. Turn right onto Metro Pl S. Site is located on the right hand side.

DRIVING DIRECTIONS

SHEET	DESCRIPTION
T-1	TITLE SHEET
N-1	GENERAL NOTES
N-2	GENERAL NOTES
A-1	BUILDING ROOF PLAN
A-2	EQUIPMENT ARRANGEMENT PLANS
A-3	ELEVATION & ANTENNA PLANS (ALL SECTORS)
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS (OUTDOOR SPECIFICATIONS)
A-6	EQUIPMENT DETAILS
RF-1	ANTENNA AND CABLE COLOR CODING DETAILS
E-1	ONE-LINE DIAGRAM & POWER PANEL SCHEDULE
E-2	ELECTRICAL DETAILS
E-3	POWER & TELCO ROUTING PLANS
E-4	GROUNDING DETAILS
E-5	GROUNDING DETAILS

### SHEET INDEX

### GENERAL DYNAMICS MARKET MANAGER:

GENERAL DYNAMICS WIRELESS SERVICES  
921 EASTWIND DRIVE SUITE 112  
WESTERVILLE, OH 43081  
CONTACT: JOHN WERNER  
PHONE #: (248) 410-4077  
EMAIL: John.Werner@gdit.com

### PROPERTY INFORMATION:

PROPERTY OWNER: GENERAL ELECTRIC CREDIT EQUITIES INC.  
ADDRESS: 500 WEST MONROE STREET  
CHICAGO, IL 60661  
CONTACT: GENERAL ELECTRIC CREDIT EQUITIES INC.  
PHONE #: (312) 441-7000

ZONING CLASSIFICATION: OS (OPEN SPACE)  
CONSTRUCTION TYPE: 2B/(NON-COMBUSTIBLE) USE GROUP "U"  
OCCUPANCY: UNMANNED  
JURISDICTION: CITY OF DUBLIN  
CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY  
NEW USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

PARCEL NUMBER (S):  
273-001313-00

### PROJECT SUMMARY

### ENGINEER:

HARPER ENGINEERING, INC.  
815 SUPERIOR AVE, SUITE 1514  
CLEVELAND, OH 44114  
CONTACT: DAVID HARPER  
PHONE: (216) 344-3855  
EMAIL: dwharper@harperengineering.org

### STRUCTURAL ENGINEER:

PAUL J FORD AND COMPANY  
250 EAST BROAD ST., SUITE 1500  
COLUMBUS, OH 43215  
CONTACT: ERIC BIEDERMAN  
PHONE: (614) 221-6679  
EMAIL: ebiederman@jfwf.com

### SITE ACQ. PROJECT MANAGER:

GENERAL DYNAMICS WIRELESS SERVICES  
921 EASTWIND DRIVE, SUITE 112  
WESTERVILLE, OH 43081  
CONTACT: ANGELA MACK  
PHONE: (614) 212-6259  
EMAIL: angela.mack@gdit.com

### CONSTRUCTION MANAGER:

GENERAL DYNAMICS WIRELESS SERVICE  
921 EASTWIND DRIVE, SUITE 112  
WESTERVILLE, OH 43081  
CONTACT: DAN ENTLER  
PHONE: (248) 207-3638  
EMAIL: Dan.Entler@gdit.com

### BUILDING DEPARTMENT:

CITY OF DUBLIN BUILDING STANDARDS  
5800 SHIER RINGS ROAD  
DUBLIN, OH 43016  
PHONE: (614) 410-4670

### RF ENGINEER:

STA NETWORK SERVICES RF MARKET LEAD (OH)  
921 EASTWIND DRIVE, SUITE 126  
WESTERVILLE, OH 43081  
CONTACT: GURINDER BIR SINGH  
PHONE: (703) 855-1458  
EMAIL: gurinder.s@sta.samsung.com

### PROJECT TEAM

## GENERAL CONSTRUCTION NOTES

- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL BUILDING CODE, THE LATEST EDITION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
- CONTRACTOR SHALL CONSTRUCT SITE IN ACCORDANCE WITH THESE DRAWINGS AND SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES (LATEST REVISION). THE SPECIFICATION IS THE RULING DOCUMENT AND ANY DISCREPANCIES BETWEEN THE SPECIFICATION AND THESE DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
- CONTRACTOR SHALL VISIT THE JOB SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE NEW WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OF FIELD CONDITION.
- PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT AND APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE WORK.
- DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
- CONTRACTOR SHALL COORDINATE HIS WORK WITH THE SUPERINTENDENT OF BUILDINGS & GROUNDS AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
- INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
- MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, PIPING ETC. AND IMMEDIATELY REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.
- IN DRILLING HOLES INTO CONCRETE WHETHER FOR FASTENING OR ANCHORING PURPOSES, OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC., MUST BE CLEARLY UNDERSTOOD THAT REINFORCING STEEL SHALL NOT BE DRILLED INTO, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES (UNLESS NOTED OTHERWISE). LOCATIONS OF REINFORCING STEEL ARE NOT DEFINITELY KNOWN AND THEREFORE MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT.
- REPAIR ALL EXISTING WALL SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND IN WITH ADJACENT SURFACES.
- SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED AND FIRE CODE APPROVED MATERIALS.
- KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
- MINIMUM BEND RADIUS OF ANTENNA CABLES SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURERS RECOMMENDATIONS.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF THE ENGINEER.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION SHALL BE IN CONFORMANCE WITH JURISDICTIONAL OR STATE AND LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL AND COORDINATED WITH LOCAL REGULATORY AUTHORITIES.
- LIGHT SHADED LINES AND NOTES REPRESENT WORK PREVIOUSLY DONE. DARK SHADED LINES AND NOTES REPRESENT THE SCOPE OF WORK FOR THIS PROJECT. CONTRACTOR SHALL VERIFY IF EXISTING CONSTRUCTION IS COMPLETE. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS AND/OR WIRING CERTIFICATES REQUIRED FOR THE ELECTRICAL SERVICE UPGRADE. IN ADDITION, CONTRACTOR SHALL PROVIDE ALL NECESSARY COORDINATION AND SCHEDULING WITH THE SERVING ELECTRICAL UTILITY AND LOCAL INSPECTION AUTHORITIES.

## ELECTRICAL NOTES

- ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ANY/ALL ELECTRICAL WORK INDICATED. ANY/ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH DRAWINGS AND ANY/ALL APPLICABLE SPECIFICATIONS. IF ANY PROBLEMS ARE ENCOUNTERED BY COMPLYING WITH THESE REQUIREMENTS, CONTRACTOR SHALL NOTIFY 'CONSTRUCTION MANAGER' AS SOON AS POSSIBLE, AFTER THE DISCOVERY OF THE PROBLEMS, AND SHALL NOT PROCEED WITH THAT PORTION OF WORK, UNTIL THE 'CONSTRUCTION MANAGER' HAS DIRECTED THE CORRECTIVE ACTIONS TO BE TAKEN.
- ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ANY/ALL CONDITIONS AFFECTING ELECTRICAL AND COMMUNICATION INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. ALL EXISTING CONDITIONS OF ELECTRICAL EQUIP., LIGHT FIXTURES, ETC., THAT ARE PART OF THE FINAL SYSTEM, SHALL BE VERIFIED BY THE CONTRACTOR, PRIOR TO THE SUBMITTAL OF HIS BID. FAILURE TO COMPLY WITH THIS PARAGRAPH WILL IN NO WAY RELIEVE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM.

3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC AND ALL CODES AND LOCAL ORDINANCES OF THE LOCAL POWER & TELEPHONE COMPANIES HAVING JURISDICTION AND SHALL INCLUDED BUT NOT BE LIMITED TO:

- UL -- UNDERWRITERS LABORATORIES
  - NEC -- NATIONAL ELECTRICAL CODE
  - NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
  - OSHA -- OCCUPATIONAL SAFETY AND HEALTH ACT
  - IBC -- INTERNATIONAL BUILDING CODE
  - NFPA -- NATIONAL FIRE CODE
- DO NOT SCALE ELECTRICAL DRAWINGS, REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, AND CONFIRM WITH 'CONSTRUCTION MANAGER' ANY SIZES AND AND LOCATIONS WHEN NEEDED.
  - EXISTING SERVICES: CONTRACTOR SHALL NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE GDOT.
  - CONTRACTOR SHALL PAY FOR ANY/ALL PERMITS, FEES, INSPECTIONS AND TESTING. CONTRACTOR IS TO OBTAIN PERMITS AND APPROVED SUBMITTALS PRIOR TO THE WORK BEGINNING OR ORDERING EQUIPMENT.
  - THE TERM "PROVIDE" USED IN CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.
  - CONTRACTOR SHALL CONFIRM WITH LOCAL UTILITY COMPANY ANY/ALL REQUIREMENTS SUCH AS THE: LUG SIZE RESTRICTIONS, CONDUIT ENTRY, SIZE OF TRANSFORMERS, SCHEDULED DOWNTIME FOR THE OWNERS' CONFIRMATION, ETC. ANY/ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER, PRIOR TO BEGINNING ANY WORK.
  - MINIMUM WIRE SIZE SHALL BE #12 AWG, NOT INCLUDING CONTROL WIRING, UNLESS NOTED OTHERWISE. ALL CONDUCTORS SHALL BE COPPER WITH THIN INSULATION.
  - OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
  - IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF THE CONSTRUCTION. CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
  - ELECTRICAL SYSTEM SHALL BE AS COMPLETELY AND EFFECTIVELY GROUNDING, AS REQUIRED BY SPECIFICATION, SET FORTH BY SPRINT.
  - ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS, WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULL OPERATIVE AND SUBJECT TO REGULATORY INSPECTION AND APPROVAL BY CONSTRUCTION MANAGER.
  - ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.
  - CONTRACTOR SHALL GUARANTEE ANY/ALL MATERIALS AND WORK FREE FROM DEFECTS OR A PERIOD OF NOT LESS THAN TWO YEARS FROM DATE OF CUSTOMER'S ACCEPTANCE.
  - THE CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ANY ADDITIONAL CHARGE AND SHALL INCLUDE THE REPLACEMENT OF THE REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREIN WITHIN 48 HOURS.
  - ADEQUATE AND REQUIRED LIABILITY INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK
  - PROVIDE AND INSTALL CONDUIT, CONDUCTORS, FULL WIRES, BOXES, COVER PLATES AND DEVICES FOR ALL OUTLETS AS INDICATED.
  - DITCHING AND BACK FILL: CONTRACTOR SHALL PROVIDE FOR ALL UNDERGROUND INSTALLED CONDUIT AND/OR CABLES INCLUDING EXCAVATION AND BACKFILLING AND COMPACTION. REFER TO NOTES AND REQUIREMENTS, EXCAVATION, AND BACKFILLING.
  - MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW AND SHALL APPEAR ON THE LIST OF UL APPROVED ITEMS AND SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NEC, NEMA AND IEEE.
  - CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR MANUFACTURERS CATALOG INFORMATION OF ANY/ALL LIGHTING FIXTURES, SWITCHES AND ALL OTHER ELECTRICAL ITEMS FOR APPROVAL BY THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
  - ANY CUTTING OR PATCHING DEEMED NECESSARY FOR ELECTRICAL WORK IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY AND SHALL BE INCLUDED IN THE COST FOR WORK AND PERFORMED TO THE SATISFACTION OF THE 'CONSTRUCTION MANAGER' UPON FINAL ACCEPTANCE.
  - THE ELECTRICAL CONTRACTOR SHALL LABEL ALL PANELS WITH ONLY TYPEWRITTEN DIRECTORIES. ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
  - DISCONNECT SWITCHES SHALL BE HP. RATED HEAVY-DUTY, QUICK-MAKE AND QUICK-BREAK ENCLOSURES, AS REQUIRED BY EXPOSURE TYPE.
  - ALL CONNECTIONS SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI-OXIDE COMPOUND SUCH AS "NO-OXIDE A" BY DEARBORNE CHEMICAL CO. COAT ALL WIRE SURFACES BEFORE CONNECTING. EXPOSED COPPER SURFACES, INCLUDING GROUND BARS, SHALL BE TREATED - NO SUBSTITUTIONS.
  - REACEWAYS: CONDUIT SHALL BE SCHEDULE 40 PVC MEETING OR EXCEEDING NEMA TC2 - 1990. CONTRACTOR SHALL PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS - 200 LBS TEST POLYETHYLENE CORD. ALL CONDUIT BENDS SHALL BE A MINIMUM OF 2 FT. RADIUS. RGS CONDUITS WHEN SPECIFIED, SHALL MEET UL-6 FOR GALVANIZED STEEL. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADED RIGID CONDUIT. COAT ALL THREADS WITH 'BRITZ ZINC' OR 'GOLD GALV'.
  - SUPPORT OF ALL ELECTRICAL WORK SHALL BE AS REQUIRED BY NEC.
  - CONDUCTORS: CONTRACTOR SHALL USE 98% CONDUCTIVITY COPPER WITH TYPE THIN INSULATION, 600 VOLT, COLOR CODED. USE SOLID CONDUCTORS FOR WIRE UP TO AND INCLUDING NO. 8 AWG. USE STRANDED CONDUCTORS FOR WIRE ABOVE NO. 8 AWG.
  - CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST-ON CONNECTORS FOR NO. 10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.
  - SERVICE: 240/120V, SINGLE PHASE, 3 WIRE CONNECTIONS AVAILABLE FROM UTILITY COMPANY. OWNER OR OWNERS AGENT WILL APPLY FOR POWER.
  - TELEPHONE SERVICE: CONTRACTOR SHALL PROVIDE EMPTY CONDUITS WITH MULE TAPE AS INDICATED ON DRAWINGS.
  - ELECTRICAL AND TELCO RACEWAYS TO BE BURIED A MINIMUM OF 2' DEPTH.
  - CONTRACTOR SHALL PLACE TWO LENGTHS OF WARNING TAPE AT A DEPTH OF 12" BELOW GROUND AND DIRECTLY ABOVE ELECTRICAL AND TELCO SERVICE CONDUITS. CAUTIONS TAPE TO READ "CAUTION BURIED ELECTRIC" OR "BURIED TELECOM".
  - ALL BOLTS SHALL BE STAINLESS STEEL.

## ANTENNA & COAX NOTES

- VERIFY EACH COAXIAL CABLE LENGTH, DIAMETER, ROUTING, COLOR CODING AND ALL APPURTENANCES WITH GDOT.
- THE MAXIMUM COAXIAL CABLE LENGTH AND CORRESPONDING COAXIAL CABLE DIAMETER IS SHOWN ON SHEET A-4. THIS CABLE LENGTH IS TO BE USED FOR FABRICATION OR CONSTRUCTION. ACTUAL ANTENNA CABLE LENGTH(S) MUST BE VERIFIED. COAXIAL CABLE SHALL BE PROVIDED BY GDOT.

3. ALL COAX CABLES SHALL UTILIZE GROUND KITS, GROUND AS FOLLOWS:

- NEAR ANTENNA RAD CENTER ELEVATION,
  - MIDDLE OF TOWER (MID-HEIGHT OF ANTENNA), IF CABLE RUN IS OVER 200',
  - BOTTOM OF TOWER,
  - AT MASTER GROUND BAR 3'-0" FROM MMBS-BBU CABINET
- ALL TOP JUMPERS SHALL BE LENGTHS AS SHOWN AND INSTALLED BY CONTRACTOR.
  - ALL CABLES SHALL BE COLOR CODED AS SHOWN ON SHEET RF-1 AND IN ACCORDANCE WITH SPRINT SPECIFICATIONS.
  - BANDING SHALL BE IN ACCORDANCE WITH SHEET A-4, RF-1 AND AS FOLLOWS:
    - MAIN LINE COLOR BANDS SHALL BE 2" WIDE, MAINTAIN 1" SPACING BETWEEN COLORS.
    - FREQUENCY COLOR BANDS SHALL BE 2" WIDE WITH NO SPACE BETWEEN COLORS.
    - JUMPER COLOR BANDS SHALL BE 1" WIDE WITH 1" SPACE.
    - START COLOR BANDS 2" BEYOND WEATHERPROOFING.
    - START SELECTOR COLOR NEXT TO END CONNECTORS.
  - FINAL COAXIAL ANTENNA CABLE SIZES SHALL BE DETERMINED BY SAMSUNG RF ENGINEER. SEE ANTENNA SCHEDULE SHEET A-4. BASED ON FINAL CABLE RUN LENGTHS DETERMINED BY GDOT.
  - SEE CONSTRUCTION MANAGER FOR ANTENNA SUPPORT ASSEMBLY TYPE.
  - ALL COAXIAL CABLE WILL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE AT DISTANCES NOT TO EXCEED 3' OR THE CABLE MANUFACTURERS SPECIFICATIONS WHICHEVER IS LESS, WITH HARDWARE SPECIFIED IN THE COAXIAL CABLE ROUTING DETAILS OF THE SUPPLIED STRUCTURAL REPORT.
  - PROVIDE AT LEAST 6" OF SLACK IN THE MAIN COAXIAL CABLES AT THE ANTENNA MOUNTING ELEVATION TO PROVIDE FOR FUTURE CONNECTOR REPLACEMENT.

## ANTENNA & HYBRID CABLE NOTES

- VERIFY EACH HYBRID CABLE LENGTH, ROUTING, DIAMETER, COLOR CODING AND ALL APPURTENANCES WITH GDOT.
- THE HYBRID CABLE AND DIAMETER LENGTH IS SHOWN ON A-4. EXCESS CABLE LENGTHS TO BE DRESSED IN A MANNER APPROVED BY GDOT. CABLES CANNOT BE CUT TO FIT.
- HYBRID CABLE INTERNAL GROUND WIRE TO BE GROUNDING AT TOP AND BOTTOM PER SAMUSUNG'S (SPRINT) SPECIFICATIONS
- EXCESS TOP 15' HYBRID CABLE FIBER JUMPERS TO BE DRESSED IN A MANNER APPROVED BY GDOT, CANNOT BE COILED, MUST BE SECURED TO TOWER MOUNTS.
- ALL MAIN CABLES SHALL BE COLOR CODED AS SHOWN ON SHEET RF-1 & IN ACCORDANCE WITH SPRINT SPECIFICATIONS.
- BANDING SHALL BE IN ACCORDANCE WITH SHEET A-4, RF-1.
  - MAIN LINE COLOR BANDS SHALL BE 2" WIDE, MAINTAIN 1" SPACING BETWEEN.
  - JUMPER COLOR BANDS SHALL BE 1" WIDE WITH 1" SPACE.
  - START COLOR BANDS 2" BEFORE MAIN CABLE END.
- FINAL HYBRID CABLE SIZES SHALL BE DETERMINED BY SAMSUNG RF ENGINEER. SEE HYBRID CABLE SCHEDULE SHEET RF-1. BASED ON FINAL CABLE RUN LENGTHS DETERMINED BY GDOT.
- ALL HYBRID CABLE WILL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE AT DISTANCES NOT TO EXCEED 3' HORIZONTALLY OR 4' VERTICALLY OR THE CABLE MANUFACTURER'S SPECIFICATIONS WHICHEVER IS LESS, WITH HARDWARE SPECIFIED IN THE HYBRID CABLE ROUTING DETAILS OF THE SUPPLIED STRUCTURAL SUPPORT.

## SITE WORK NOTES

- DO NOT EXCAVATE OR DISTURB BEYOND THE PROPERTY LINES OR LEASE LINES, UNLESS OTHERWISE NOTED.
- DO NOT SCALE BUILDING DIMENSIONS FROM DRAWING.
- SIZE, LOCATION AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS SHALL BE ACCURATELY NOTED AND PLACED ON AS-BUILT DRAWINGS BY GENERAL CONTRACTOR AND ISSUED TO ARCHITECT/ENGINEER AT COMPLETION OF PROJECT.
- ALL EXISTING UTILITIES, FACILITIES, CONDITIONS AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ENGINEER AND OWNER ASSUME NOT RESPONSIBILITY WHATSOEVER AS TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL EXISTING UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING EXISTING UTILITIES.
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHALL BE IMMEDIATELY REPORTED TO THE ARCHITECT/ENGINEER FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT/ENGINEER. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS/HER OWN RISK AND EXPENSE.
- CONTRACTOR SHALL CALL LOCAL DIGGER HOT LINE FOR UTILITY LOCATIONS 48 HOURS PRIOR TO START OF CONSTRUCTION.
- ALL NEW AND EXISTING UTILITY STRUCTURES ON SITE AND IN AREAS TO BE DISTURBED BY CONSTRUCTION SHALL BE ADJUSTED TO FINISH ELEVATIONS PRIOR TO FINAL INSPECTION OF WORK.
- GRADING OF THE SITE WORK AREA IS TO BE SMOOTH AND CONTINUOUS IN SLOPE AND IS TO FEATHER INTO EXISTING GRADES AT THE GRADING LIMITS.
- ALL TEMPORARY EXCAVATIONS FOR THE INSTALLATION OF FOUNDATIONS, UTILITIES, ETC., SHALL BE PROPERLY LAID BACK OR BRACED IN ACCORDANCE WITH CORRECT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.
- STRUCTURAL FILLS SUPPORTING PAVEMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM STANDARD PROCTOR DRY DENSITY.
- NEW GRADES NOT IN BUILDING AND DRIVEWAY IMPROVEMENT AREA TO BE ACHIEVED BY FILLING WITH APPROVED CLEAN FILL AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.
- ALL FILL SHALL BE PLACED IN UNIFORM LIFTS. THE LIFTS THICKNESS SHOULD NOT EXCEED THAT WHICH CAN BE PROPERLY COMPACTED THROUGHOUT ITS ENTIRE DEPTH WITH THE EQUIPMENT AVAILABLE.
- ANY FILLS PLACED ON EXISTING SLOPES THAT ARE STEEPER THAN 10 HORIZONTAL TO 1 VERTICAL SHALL BE PROPERLY BENCHED INTO THE EXISTING SLOPE AS DIRECTED BY A GEOTECHNICAL ENGINEER.
- CONTRACTOR SHALL CLEAN ENTIRE SITE DAILY AFTER CONSTRUCTION SUCH THAT NO PAPERS, THRASH, WEEDS, BRUSH OR ANY OTHER DEPOSITS WILL REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE DISPOSED OF OFF-SITE BY THE GENERAL CONTRACTOR.
- ALL TREES AND SHRUBS WHICH ARE NOT IN DIRECT CONFLICT WITH THE IMPROVEMENTS SHALL BE PROTECTED BY THE GENERAL CONTRACTOR.
- ALL SITE WORK SHALL BE CAREFULLY COORDINATED BY GENERAL CONTRACTOR WITH LOCAL UTILITY COMPANY, TELEPHONE COMPANY, AND ANY OTHER UTILITY COMPANIES HAVING JURISDICTION OVER THIS LOCATION.

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SAMSUNG

GENERAL DYNAMICS

Wireless Services

HARPER

ENGINEERING, INC.

TELECOM GROUP

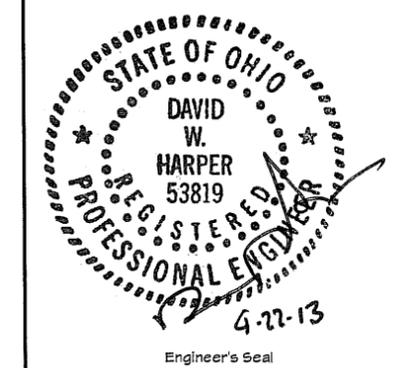
815 Superior Ave. Suite 1514  
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## DRAWING REVISIONS

Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
0	For Construction	04/22/13	DWH



ENGINEER'S SEAL

NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO  
PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:

GENERAL  
NOTES

SHEET No./Rev.:

N-1/0

SCALE: AS NOTED  
DRWN. BY: MCM  
CHKD. BY: MAD  
Date: 02/06/13  
cad file: 12-112-061



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NETWORK VISION MMB5 LAUNCH  
(LB-FUNDED) METRO  
PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
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<b>N-2/0</b>	SHEET No./Rev.:	SCALE: AS NOTED
		DRNN. BY: MCM
		CHKD. BY: MAD
		Date: 02/06/13
		cad file: 12-172-063

**FOUNDATION, EXCAVATION AND BACKFILL NOTES:**

- ALL FINAL GRADED SLOPES SHALL BE A MAXIMUM OF 3 HORIZONTAL TO 1 VERTICAL.
- ALL EXCAVATIONS PREPARED FOR PLACEMENT OF CONCRETE SHALL BE OF UNDISTURBED SOILS, SUBSTANTIALLY HORIZONTAL AND FREE FROM ANY LOOSE, UNSUITABLE MATERIAL OR FROZEN SOILS, AND WITHOUT THE PRESENCE OF FOUNDED WATER. DEWATERING FOR EXCESS GROUND WATER SHALL BE PROVIDED WHEN REQUIRED. COMPACTION OF SOILS UNDER CONCRETE PAD FOUNDATIONS SHALL NOT BE LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR THE SOIL IN ACCORDANCE WITH ASTM D 1557.
- CONCRETE FOUNDATIONS SHALL NOT BE PLACED ON ORGANIC OR UNSUITABLE MATERIAL. IF INADEQUATE BEARING CAPACITY IS REACHED AT THE DESIGNED EXCAVATION DEPTH, THE UNSATISFACTORY SOIL SHALL BE EXCAVATED TO ITS FULL DEPTH AND EITHER BE REPLACED WITH MECHANICALLY COMPACTED GRANULAR MATERIAL OR THE EXCAVATION SHALL BE FILLED WITH CONCRETE OF THE SAME TYPE SPECIFIED FOR THE FOUNDATION. CRUSHED STONE MAY BE USED TO STABILIZE THE BOTTOM OF THE EXCAVATION. ANY STONE SUB BASE MATERIAL THAT IS USED SHALL NOT BE A SUBSTITUTE FOR REQUIRED THICKNESS OF CONCRETE.
- ALL EXCAVATIONS SHALL BE CLEAN OF UNSUITABLE MATERIAL PRIOR TO BACK FILLING, SUCH AS VEGETATION, TRASH, DEBRIS, AND SO FORTH. BACK FILL SHALL CONSIST OF APPROVED MATERIALS SUCH AS EARTH, LOAM SANDY CLAY, SAND AND GRAVEL, OR SOFT SHALE, FREE FROM CLODS OR LARGE STONES OVER 2 1/2". ALL BACK FILL SHALL BE PLACED IN COMPACTED LAYERS.
- ALL FILL MATERIALS AND FOUNDATION BACK FILL SHALL BE PLACED AT 6" THICK LIFTS MAX. BEFORE COMPACTION. EACH LIFT SHALL BE WETTED, IF REQUIRED, AND COMPACTED TO NOT LESS THAN 95% OF THE MODIFIED PROCTOR MAX. DRY DENSITY FOR SOIL IN ACCORDANCE WITH ASTM D 1557.
- NEWLY PLACED CONCRETE FOUNDATIONS SHALL CURE A MINIMUM OF 72 HRS PRIOR TO BACK FILLING.
- FINISHED GRADING SHALL BE SLOPED TO PROVIDE POSITIVE DRAINAGE AND PREVENT STANDING WATER. THE FINAL (FINISH) ELEVATION OF SLAB FOUNDATIONS SHALL SLOPE AWAY IN ALL DIRECTIONS FROM THE CENTER. FINISH GRADE OF CONCRETE PADS SHALL BE A MAXIMUM OF 4 INCHES ABOVE FINAL FINISH GRADE ELEVATIONS. PROVIDE SURFACE FILL GRAVEL TO ESTABLISH SPECIFIED ELEVATIONS WHERE REQUIRED.
- NEWLY GRADED SURFACE AREAS TO RECEIVE GRAVEL SHALL BE COVERED WITH GEOTEXTILE FABRIC TYPE: TYPAR-3401 AS MANUFACTURED BY "CONSTRUCTION MATERIAL 1-800-239-3841" OR AN APPROVED EQUAL. THE GEOTEXTILE FABRIC SHALL BE BLACK IN COLOR TO CONTROL THE RECURRENCE OF VEGETATIVE GROWTH AND EXTEND TO WITHIN 1 FOOT OUTSIDE THE SITE FENCING OR ELECTRICAL GROUNDING SYSTEM PERIMETER WHICH EVER IS GREATER. ALL FABRIC SHALL BE COVERED WITH A MINIMUM OF 4" DEEP COMPACTED STONE OR GRAVEL AS SPECIFIED. I.E. FDOT TYPE No. 57 FOR FENCED COMPOUND; FDOT TYPE No. 67 FOR ACCESS DRIVE AREA.
- IN ALL AREAS TO RECEIVE FILL, REMOVE ALL VEGETATION, TOPSOIL, DEBRIS, NET AND UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE. PLOW STRIP OR BREAK UP SLOPED SURFACES STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL SUCH THAT FILL MATERIAL WILL BIND WITH EXISTING/PREPARED SOIL SURFACE.
- WHEN SUB GRADE OR PREPARED GROUND SURFACE HAS A DENSITY LESS THAN THAT REQUIRED FOR THE FILL MATERIAL, SCARIFY THE GROUND SURFACE TO DEPTH REQUIRED, PULVERIZE, MOISTURE-CONDITION AND/OR AERATE THE SOILS AND RE-COMPACT TO THE REQUIRED DENSITY PRIOR TO PLACEMENT OF FILLS.
- IN AREAS WHICH EXISTING GRAVEL SURFACING IS REMOVED OR DISTURBED DURING CONSTRUCTION OPERATIONS, REPLACE GRAVEL SURFACING TO MATCH ADJACENT GRAVEL SURFACING AND RESTORED TO THE SAME THICKNESS AND COMPACTION AS SPECIFIED. ALL RESTORED GRAVEL SURFACING SHALL BE FREE FROM CORRUGATIONS AND WAVES.
- EXISTING GRAVEL SURFACING MAY BE EXCAVATED SEPARATELY AND REUSED WITH THE CONDITION THAT ANY UNFAVORABLE AMOUNTS OF ORGANIC MATTER, OR OTHER DELETERIOUS MATERIALS ARE REMOVED PRIOR TO REUSE. FURNISH ANY ADDITIONAL GRAVEL RESURFACING MATERIAL AS NEEDED TO PROVIDE A FULL DEPTH COMPACTED SURFACE THROUGHOUT SITE.
- GRAVEL SUB SURFACE SHALL BE PREPARED TO REQUIRED COMPACTION AND SUB GRADE ELEVATIONS, BEFORE GRAVEL SURFACING IS PLACED AND/OR RESTORED. ANY LOOSE OR DISTURBED MATERIALS SHALL BE THOROUGHLY COMPACTED AND ANY DEPRESSIONS IN THE SUB GRADE SHALL BE FILLED AND COMPACTED WITH APPROVED SELECTED MATERIAL. GRAVEL SURFACING MATERIAL SHALL NOT BE USED FOR FILLING DEPRESSIONS IN THE SUB GRADE.
- PROTECT EXISTING GRAVEL SURFACING AND SUB GRADE IN AREAS WHERE EQUIPMENT LOADS WILL OPERATE.
- DAMAGE TO EXISTING STRUCTURES AND/OR UTILITIES RESULTING FROM CONTRACTORS NEGLIGENCE SHALL BE REPAIRED AND/OR REPLACED TO THE OWNERS SATISFACTION AT NO ADDITIONAL COST TO THE CONTRACT.
- ALL SUITABLE BORROW MATERIAL FOR BACK FILL OF THE SITE SHALL BE INCLUDED IN THE BID. EXCESS TOPSOIL AND UNSUITABLE MATERIAL SHALL BE DISPOSED OF OFF SITE AT LOCATIONS APPROVED BY GOVERNING AGENCIES AT NO ADDITIONAL COST TO THE CONTRACT.

**ENVIRONMENTAL NOTES:**

- ALL WORK PERFORMED SHALL BE DONE IN ACCORDANCE WITH ISSUED PERMITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF FINES AND PROPER CLEAN UP FOR AREAS IN VIOLATION.
- CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS FOR THE PROTECTION OF ADJACENT PROPERTIES, ROADWAYS AND WATERWAYS DURING CONSTRUCTION AND SHALL BE MAINTAINED IN PLACE THROUGH FINAL JURISDICTIONAL INSPECTION & RELEASE OF SITE.
- CONTRACTOR SHALL INSTALL/CONSTRUCT ALL NECESSARY SEDIMENT/SILT CONTROL FENCING AND PROTECTIVE MEASURES WITHIN THE LIMITS OF SITE DISTURBANCE PRIOR TO CONSTRUCTION.
- NO SEDIMENT SHALL BE ALLOWED TO EXIT THE PROPERTY. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ADEQUATE MEASURES FOR CONTROLLING EROSION. ADDITIONAL SEDIMENT CONTROL FENCING MAY BE REQUIRED IN ANY AREAS SUBJECT TO EROSION.
- THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE ON THE SITE AT ALL TIMES WITH SILT AND EROSION CONTROL MEASURES MAINTAINED ON THE DOWNSTREAM SIDE OF SITE DRAINAGE. ANY DAMAGE TO ADJACENT PROPERTY AS A RESULT OF EROSION WILL BE CORRECTED AT THE CONTRACTORS EXPENSE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY INSPECTIONS AND ANY REPAIRS OF ALL SEDIMENT CONTROL MEASURES INCLUDING SEDIMENT REMOVAL AS NECESSARY.
- VEGETATION CLEARING AND TREE REMOVAL, THAT IS NECESSARY FOR FACILITIES CONSTRUCTION, ARE ONLY AS PERMITTED BY OWNER AND MUST BE HELD TO A MINIMUM.
- SEEDING, SAND MULCHING AND/OR SODDING OF THE SITE WILL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF THE PROJECT FACILITIES AFFECTING LAND DISTURBANCE.
- CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENTATION CONTROL MEASURES, AS REQUIRED BY LOCAL, COUNTY AND STATE CODES AND ORDINANCES, TO PROTECT EMBANKMENTS FROM SOIL LOSS AND TO PREVENT ACCUMULATION OF SOIL AND SILT IN STREAMS AND DRAINAGE PATHS LEAVING THE CONSTRUCTION AREA. THIS MAY INCLUDE SUCH MEASURES AS SILT FENCES, STRAW BALE SEDIMENT BARRIERS, AND CHECK DAMS.
- RIP RAP, OF SIZES INDICATED, SHALL CONSIST OF CLEAN, HARD, SOUND, DURABLE, UNIFORM IN QUALITY STONE, FREE OF ANY DETRIMENTAL QUANTITY OF SOFT, FRIABLE, THIN, ELONGATED OR LAMINATED PIECES, DISINTEGRATED MATERIAL, ORGANIC MATTER, OIL, ALKALI, OR OTHER DELETERIOUS SUBSTANCES.

**STRUCTURAL STEEL NOTES:**

- ALL STEEL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC MANUAL OF STEEL CONSTRUCTION. STEEL SECTIONS SHALL BE IN ACCORDANCE WITH ASTM AS INDICATED BELOW:
  - A. W-SHAPES: ASTM A992, 50 KSI
  - B. ANGLES, BARS CHANNELS: ASTM A36, 36 KSI
  - C. HSS SECTIONS: ASTM 500, 46 KSI
  - D. PIPE SECTIONS: ASTM A53-B, 35 KSI
- ALL EXTERIOR EXPOSED STEEL AND HARDWARE SHALL BE HOT DIPPED GALVANIZED.
- ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
- NON-STURCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8"Ø ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
- FIELD MODIFICATIONS ARE TO BE COATED WITH ZINC ENRICHED PAINT.

**CONCRETE MASONRY NOTES:**

- CONCRETE MASONRY UNITS SHALL BE MEDIUM WEIGHT UNITS CONFORMING TO ASTM C90, GRADE N-1, (Fm= 1,500 PSI), MEDIUM WEIGHT (1.15 PCF).
- MORTAR SHALL BE TYPE "S" (MINIMUM 1,800 PSI AT 28 DAYS).
- GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
- ALL CELLS CONTAINING REINFORCING STEEL OR EMBEDDED ITEMS AND IN RETAINING WALLS AND WALLS BELOW GRADE SHALL BE SOLID GROUTED.
- ALL HORIZONTAL REINFORCEMENT SHALL BE PLACED IN BOND BEAM OR LINTEL BEAM UNITS.
- WHEN GROUTING IS STOPPED FOR ONE HOUR OR LONGER, HORIZONTAL CONSTRUCTION JOINTS SHALL BE FORMED BY STOPPING THE GROUT POUR 1-1/2" BELOW TOP OF THE UPPERMOST UNIT.
- ALL BOND BEAM BLOCK SHALL BE "DEEP CUT" UNITS.
- PROVIDE INSPECTION AND CLEAN-OUT HOLES AT BASE OF VERTICAL CELLS HAVING GROUT LIFTS IN EXCESS OF 4'-0" OF HEIGHT.
- ALL GROUT SHALL BE CONSOLIDATED WITH A MECHANICAL VIBRATOR.
- CEMENT SHALL BE AS SPECIFIED FOR CONCRETE.
- REINFORCING BARS - SEE NOTES UNDER "STRUCTURAL CONCRETE NOTES" FOR REQUIREMENTS.
- PROVIDE ONE BAR DIAMETER (A MINIMUM OF 1/2") GROUT BETWEEN MAIN REINFORCING AND MASONRY UNITS.
- LOW LIFT CONSTRUCTION, MAXIMUM GROUT POUR HEIGHT IS 4 FEET.
- HIGH LIFT GROUTED CONSTRUCTION MAY BE USED IN CONFORMANCE WITH PROJECT SPECIFICATIONS AND SECTION 2104.6.1 OF U.B.C.
- ALL CELLS IN CONCRETE BLOCKS SHALL BE FILLED SOLID WITH GROUT, EXCEPT AS NOTED IN THE DRAWINGS OR SPECIFICATIONS.
- CELLS SHALL BE IN VERTICAL ALIGNMENT, DOWELS IN FOOTINGS SHALL BE SET TO ALIGN WITH CORES CONTAINING REINFORCING STEEL.
- REFER TO ARCHITECTURAL DRAWINGS FOR SURFACE AND HEIGHT OF UNITS, LAYING PATTERN AND JOINT TYPE.
- SAND SHALL BE CLEAN, SHARP AND WELL GRADED, FREE FROM INJURIOUS AMOUNTS OF DUST, LUMPS, SHALE, ALKALI OR ORGANIC MATERIAL.
- BRICK SHALL CONFORM TO ASTM C-62 AND SHALL BE GRADE MW OR BETTER.

**STRUCTURAL CONCRETE NOTES:**

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301-10, ACI 318-08 AND THE SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH fc=3,000 PSI AT 28 DAYS UNLESS NOTED OTHERWISE.
- REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES CLASS "B" AND ALL HOOKS SHALL BE STANDARD UNLESS NOTED OTHERWISE.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

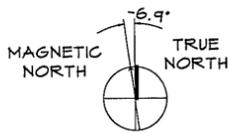
- CONCRETE CAST AGAINST EARTH.....3 IN.
- CONCRETE EXPOSED TO EARTH OR WEATHER:
  - #6 AND LARGER.....2 IN.
  - #5 AND SMALLER & WWF.....1 1/2 IN.
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
  - SLAB AND WALL.....3/4 IN.
  - BEAMS AND COLUMNS.....1 1/2 IN.
- A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE U.N.O. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4
- HOLDS TO RECEIVE EXPANSION/WEDGE ANCHORS SHALL BE 1/8" LARGER IN DIAMETER THAN THE ANCHOR BOLT, DOWEL OR ROD AND SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. LOCATE AND AVOID CUTTING EXISTING REBAR WHEN DRILLING HOLES IN ELEVATED CONCRETE SLABS.
- USE AND INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER ICBO & MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURES.

**WEATHERPROOFING NOTES:**

- STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES
- 1.0 WEATHERPROOFING CONNECTORS AND GROUND KITS:
  - A. ALL CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED USING BUTYL RUBBER WEATHERPROOFING AND TAPE. THIS INSTALLATION MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION OR AS SHOWN ON THE CONSTRUCTION DRAWINGS (WHICHEVER IS GREATER). IF NO DIRECTION IS PROVIDED, WEATHERPROOFING MUST BE DONE PER THE FOLLOWING INSTRUCTIONS.
    - THE COAX CABLE CONNECTION OR GROUND KIT CAN BE ENCOMPASSED INTO COLD SHRINK AND COMPLETELY WRAPPED WITH 2 INCH WIDE ELECTRICAL TAPE OVERLAPPING EACH ROW BY APPROXIMATELY 1/2" AND EXTENDING PAST THE CONNECTION BY TWO INCHES AS DISCUSSED BELOW; OR
    - THE COAX CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH LAYERS OF ELECTRICAL/BUTYL RUBBER/ELECTRICAL TAPE AS DISCUSSED BELOW; OR
    - THE COAX CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH TWO LAYERS OF 1.5 INCH WIDE SELF-AMALGAMATING TAPE COVERED WITH TWO LAYERS OF ELECTRICAL TAPE AS DISCUSSED BELOW.

**WEATHERPROOFING NOTES CONTINUED:**

- B. COLD SHRINK INSTALLATION PROCEDURE:
  - REQUIRED MATERIAL: COLD SHRINK TUBE, SPACERS AS NEEDED, BLACK ELECTRICAL TAPE- 2 INCHES WIDE.
  - REQUIRED TOOLS: KNIFE AND TAPE MEASURE.
    - STEP 1: THOROUGHLY CLEAN AND DRY THE SURFACE OF COAX CABLE AND CONNECTOR TO REMOVE ALL GREASE AND DIRT. MARK THE MAIN FEED (LARGER DIAMETER) COAX CABLE AT LEAST TWO INCHES ABOVE THE CONNECTION AS THE SPECIFIED START DIMENSION FOR THE COLD SHRINK.
    - STEP 2: SLIDE THE COLD SHRINK TUBE OVER THE PRE-CONNECTED END OF THE LARGER DIAMETER COAX CABLE PRIOR TO MATING CONNECTOR AND MAKE THE CONNECTION.
    - STEP 3: REMOVE WAX PAPER FROM A SPACER HALF AND PRESS ONTO COAX CABLE DIRECTLY BEHIND THE CONNECTOR. REMOVE THE WAX PAPER FROM THE OTHER SPACER HALF AND ALIGN THE TWO SPACER HALVES WITH ADHESIVE PORTIONS FACING EACH OTHER. PRESS THE SPACER HALVES TOGETHER. THE SPACER WILL BE PLACED NEXT TO THE CONNECTOR ON THE SMALLER DIAMETER COAX CABLE SIDE.
    - STEP 4: SLIDE THE COLD SHRINK TUBE OVER THE CONNECTION TO THE SPECIFIED START DIMENSION MARK. HOLD THE COLD SHRINK TUBE AND COAX CABLE IN ONE HAND SO THAT THE EDGE OF COLD SHRINK TUBE IS IN LINE WITH THE MARK.
    - STEP 5: WITH YOUR FREE HAND, BEGIN REMOVING COLD SHRINK TUBE CORE. THE CORE WILL BE REMOVED BY UNWINDING IN A COUNTERCLOCKWISE DIRECTION WHILE LIGHTLY PULLING THE ATTACHED CORD AWAY FROM THE TUBE.
    - STEP 6: USE BOTH HANDS TO CONTINUE THE UNWINDING PROCESS AS THE COLD SHRINK TUBE BEGINS TO COLLAPSE INTO POSITION. CONTINUE THE UNWINDING PROCESS UNTIL THE CORE IS COMPLETELY REMOVED AND THE COLD SHRINK TUBE IS INSTALLED.
    - STEP 7: EXCESS COLD SHRINK TUBE EXTENDING TWO INCHES BEYOND THE SPACER HALVES CAN BE REMOVED OR LEFT IN PLACE. EXCESS COLD SHRINK TUBE CAN BE CAREFULLY CUT OFF WITH A KNIFE.
    - STEP 8: WRAP OVER THE COLD SHRINK TUBE WITH ONE LAYER OF 2 INCH WIDE BLACK ELECTRICAL TAPE, OVERLAPPING EACH ROW BY 1/2 INCH. THIS TOP LAYER MUST BE WRAPPED USING A SHINGLED EFFECT. THE LAYER SHALL BE WRAPPED SO THAT THE ENDS ARE IN THE UPWARD DIRECTION CREATING A SHINGLED EFFECT WITH THE TAPE, SO WATER WILL BE REPELLED AND NOT ALLOWED TO COLLECT AND POOL. THIS TOP LAYER OF ELECTRICAL TAPE MUST EXTEND TWO INCHES (THE TAPE WIDTH) PAST THE COLD SHRINK TUBE ONTO THE UNDERLYING CABLE. TAPE SHALL BE WRAPPED SO THAT NO VOIDS OR AIR POCKETS ARE PRESENT. TAPE SHALL BE CUT WITH A SHARP KNIFE.
- C. BUTYL RUBBER TAPE INSTALLATION PROCEDURE:
  - REQUIRED MATERIAL: BLACK ELECTRICAL TAPE-2 INCH WIDE AND BUTYL RUBBER TAPE 2 TO 3 INCHES WIDE.
  - REQUIRED TOOLS: KNIFE OR SCISSORS.
    - STEP 1: THOROUGHLY CLEAN AND DRY THE SURFACE OF COAX CABLE AND CONNECTOR TO REMOVE ALL GREASE AND DIRT. WRAP CONNECTOR/GROUND KIT WITH TWO LAYERS OF 2 INCH WIDE BLACK ELECTRICAL TAPE, OVERLAPPING EACH ROW BY APPROXIMATELY 1/2 INCH. THESE LAYERS OF TAPE MUST BE WRAPPED TIGHT ENOUGH SO THAT NO VOIDS OR AIR POCKETS ARE PRESENT AND MUST EXTEND ONE INCH PAST THE CONNECTOR/GROUND KIT ON EACH SIDE. TWO ROWS SHALL BE APPLIED, ONE IN EACH DIRECTION, WITH THE TOP ROW SHINGLED TO PROMOTE WATER RUNOFF.
    - STEP 2: WRAP CONNECTOR/GROUND KIT WITH ONE LAYER OF BUTYL RUBBER TAPE (2 TO 3 INCHES WIDE) OVER THE BLACK ELECTRICAL TAPE, OVERLAPPING EACH ROW BY APPROXIMATELY 1/2 INCH. THE BUTYL RUBBER TAPE MUST EXTEND 2 TO 3 INCHES (THE TAPE WIDTH) PAST THE ELECTRICAL TAPE AND COME IN GOOD CONTACT WITH THE UNDERLYING CABLE. FOR CONNECTORS, WHEN WEATHERPROOFING FROM THE MAIN LINE TO THE JUMPER, BUILD UP THIS AREA WITH EXTRA BUTYL RUBBER TAPE TO INSURE A SMOOTH TRANSITION FREE OF VOIDS AND AIR POCKETS DOWN TO THE SMALLER DIAMETER CABLE.
    - STEP 3: WRAP CONNECTOR/GROUND KIT WITH TWO LAYERS OF 2 INCH WIDE BLACK ELECTRICAL TAPE, OVERLAPPING EACH ROW BY 1 INCH. THESE LAST TWO LAYERS MUST BE WRAPPED USING A SHINGLED EFFECT. THE TOP LAYER SHALL BE WRAPPED SO THAT THE ENDS ARE IN THE UPWARD DIRECTION CREATING A SHINGLED EFFECT WITH THE TAPE, SO WATER WILL BE REPELLED AND NOT ALLOWED TO COLLECT AND POOL. THESE TOP LAYERS OF ELECTRICAL TAPE MUST EXTEND TWO INCHES (THE TAPE WIDTH) PAST THE BUTYL RUBBER TAPE ONTO THE UNDERLYING CABLE. ALL LAYERS OF TAPE SHALL BE WRAPPED SO THAT NO VOIDS OR AIR POCKETS ARE PRESENT. THE LAST WRAP OF TAPE SHALL NOT BE PULLED OR STRETCHED. ALL TAPE SHALL BE CUT WITH A SHARP KNIFE OR SCISSORS.
- D. SELF-AMALGAMATING TAPE INSTALLATION PROCEDURE:
  - REQUIRED MATERIAL: SELF-AMALGAMATING TAPE - 1.5 INCHES WIDE AND BLACK ELECTRICAL TAPE - 2 INCHES WIDE.
  - REQUIRED TOOLS: KNIFE OR SCISSORS.
    - STEP 1: THOROUGHLY CLEAN AND DRY THE SURFACE OF COAX CABLE AND CONNECTOR TO REMOVE ALL GREASE AND DIRT.
    - STEP 2: START WRAPPING SELF-AMALGAMATING TAPE ON THE CABLE AT LEAST 2 INCHES FROM THE CONNECTOR/GROUND KIT. MAKE SURE TAPE IS STRETCHED TIGHT DURING THIS APPLICATION.
    - STEP 3: WHILE STRETCHING TAPE, MAKE ONE WRAP OF THE TAPE AROUND THE CABLE, MAKING SURE THE TAPE IS WRAPPED ONTO ITSELF. THE TAPE WILL ONLY ADHERE TO ITSELF.
    - STEP 4: CONTINUE WRAPPING THE CABLE AND CONNECTOR/GROUND KIT USING HALF OVERLAP (0.75 INCH WIDE) LAYERS.
    - STEP 5: WRAP OVER AND PAST THE CONNECTOR/GROUND KIT AT LEAST 2 INCHES.
    - STEP 6: TO TERMINATE THE SELF-AMALGAMATING TAPE, WRAP THE TAPE AT LEAST ONE FULL ROUND OVER THE CABLE, STRETCHING THE TAPE TIGHT. CUT THE TAPE USING KNIFE OR SCISSORS AND APPLY OVER THE CABLE, STRETCHING THE TAPE TIGHT. CUT THE TAPE USING KNIFE OR SCISSORS AND APPLY.
    - STEP 7: TWO ROWS OF SELF-AMALGAMATING TAPE SHALL BE APPLIED IN ALTERNATING DIRECTIONS. THE TOP LAYER SHALL BE WRAPPED SO THAT THE ENDS ARE IN AN UPWARD DIRECTION CREATING A SHINGLED EFFECT WITH THE TAPE SO WATER WILL BE REPELLED.
    - STEP 8: WRAP OVER SELF-AMALGAMATING TAPE WITH TWO LAYERS OF 2 INCH WIDE BLACK ELECTRICAL TAPE, OVERLAPPING EACH ROW BY 1 INCH. THESE TOP TWO LAYERS MUST ALSO BE WRAPPED USING A SHINGLED EFFECT. THE LAYERS SHALL BE WRAPPED SO THAT THE ENDS ARE IN THE UPWARD DIRECTION CREATING A SHINGLED EFFECT WITH THE TAPE, SO WATER WILL BE REPELLED AND NOT ALLOWED TO COLLECT AND POOL. THESE TOP LAYERS OF ELECTRICAL TAPE MUST EXTEND TWO INCHES (THE TAPE WIDTH) PAST THE SELF-AMALGAMATING TAPE ONTO THE UNDERLYING CABLE. ALL LAYERS OF TAPE SHALL BE WRAPPED SO THAT NO VOIDS OR AIR POCKETS ARE PRESENT. THE LAST WRAP OF TAPE SHALL NOT BE PULLED OR STRETCHED. ALL TAPE SHALL BE CUT WITH A SHARP KNIFE OR SCISSORS.



**NOTE:**

1. SEE DRAWING N-1 & N-2 FOR GENERAL NOTES
2. SEE DETAIL 1 ON DRAWING A-3 FOR ELEVATION
3. SEE DRAWING A-3 ANTENNA LAYOUTS
4. CONTRACTOR TO OBTAIN A STRUCTURAL ANALYSIS AND SIGNED AND SEALED CONSTRUCTION DRAWINGS PRIOR TO CONSTRUCTION.



6550 SPRINT PARKWAY  
OVERLAND PARK, KS 66251  
PHONE: (913) 762-2000



**GENERAL DYNAMICS**  
Wireless Services

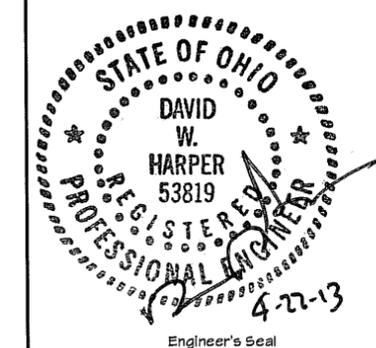
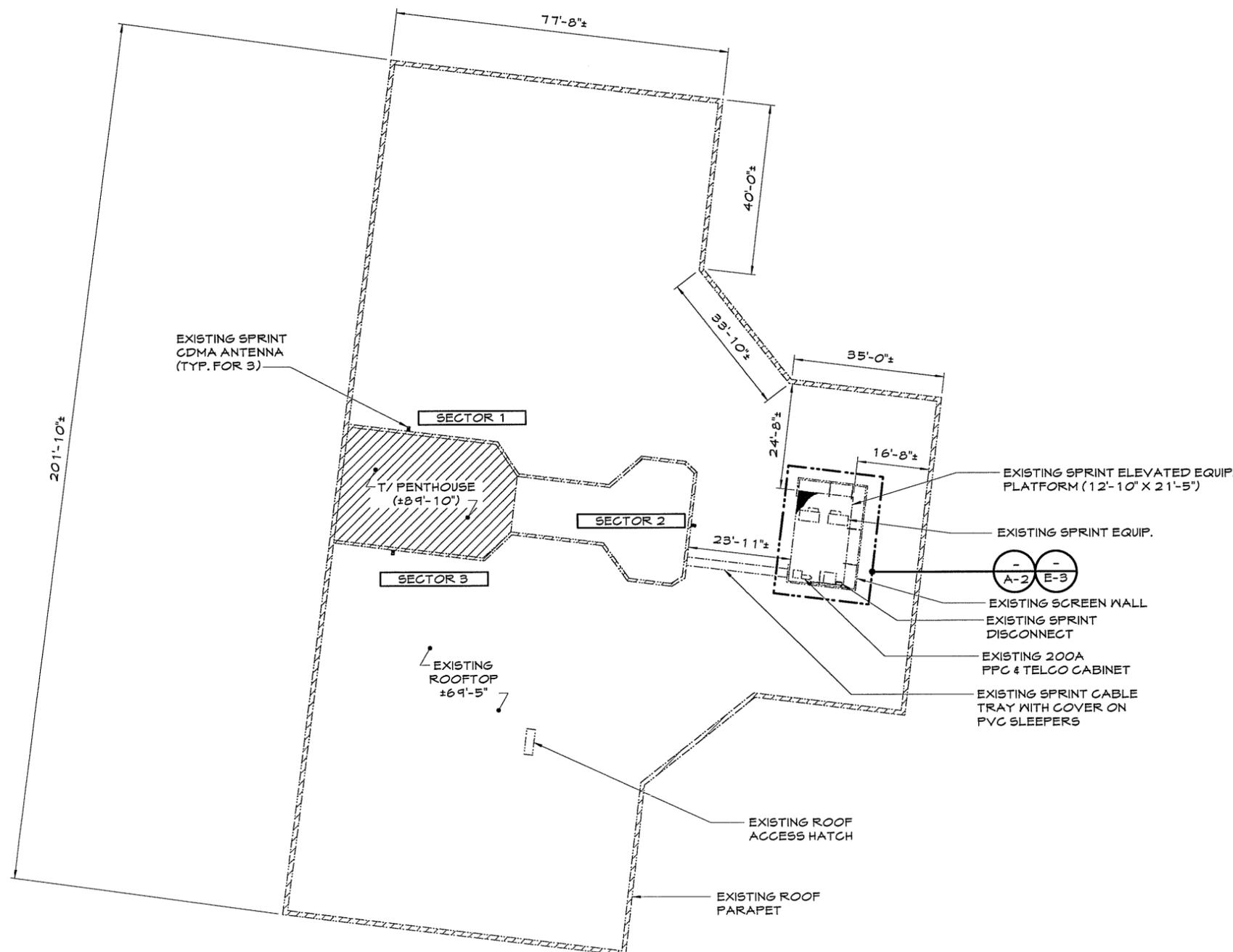
**HARPER**  
**ENGINEERING, INC.**  
TELECOM GROUP

815 Superior Ave. Suite 1514  
Cleveland, OH. 44114

Phone: (216)344-3855  
Fax: (216)344-3856

**DRAWING REVISIONS**

Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
O	For Construction	04/22/13	DWH



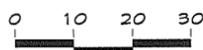
NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE

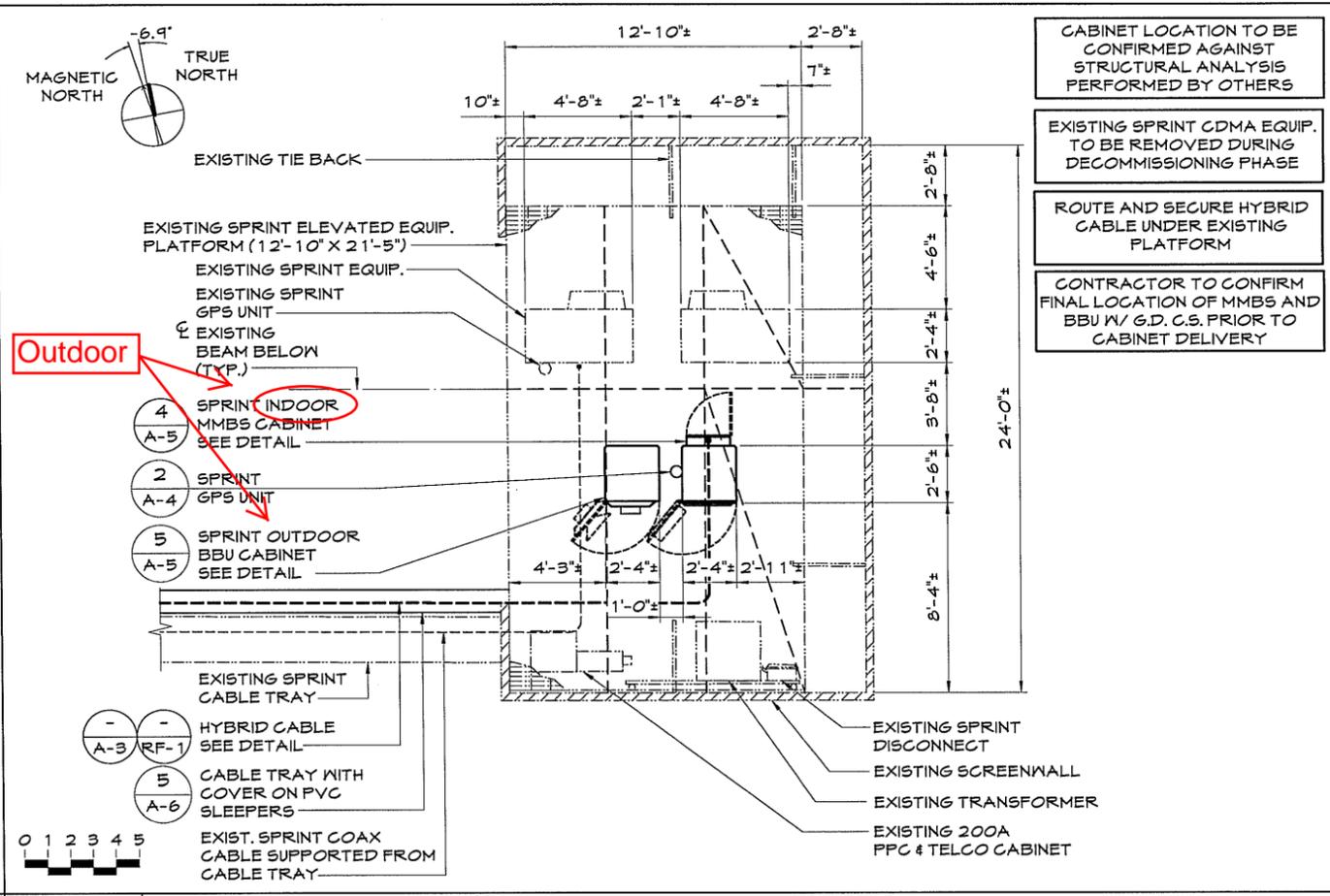
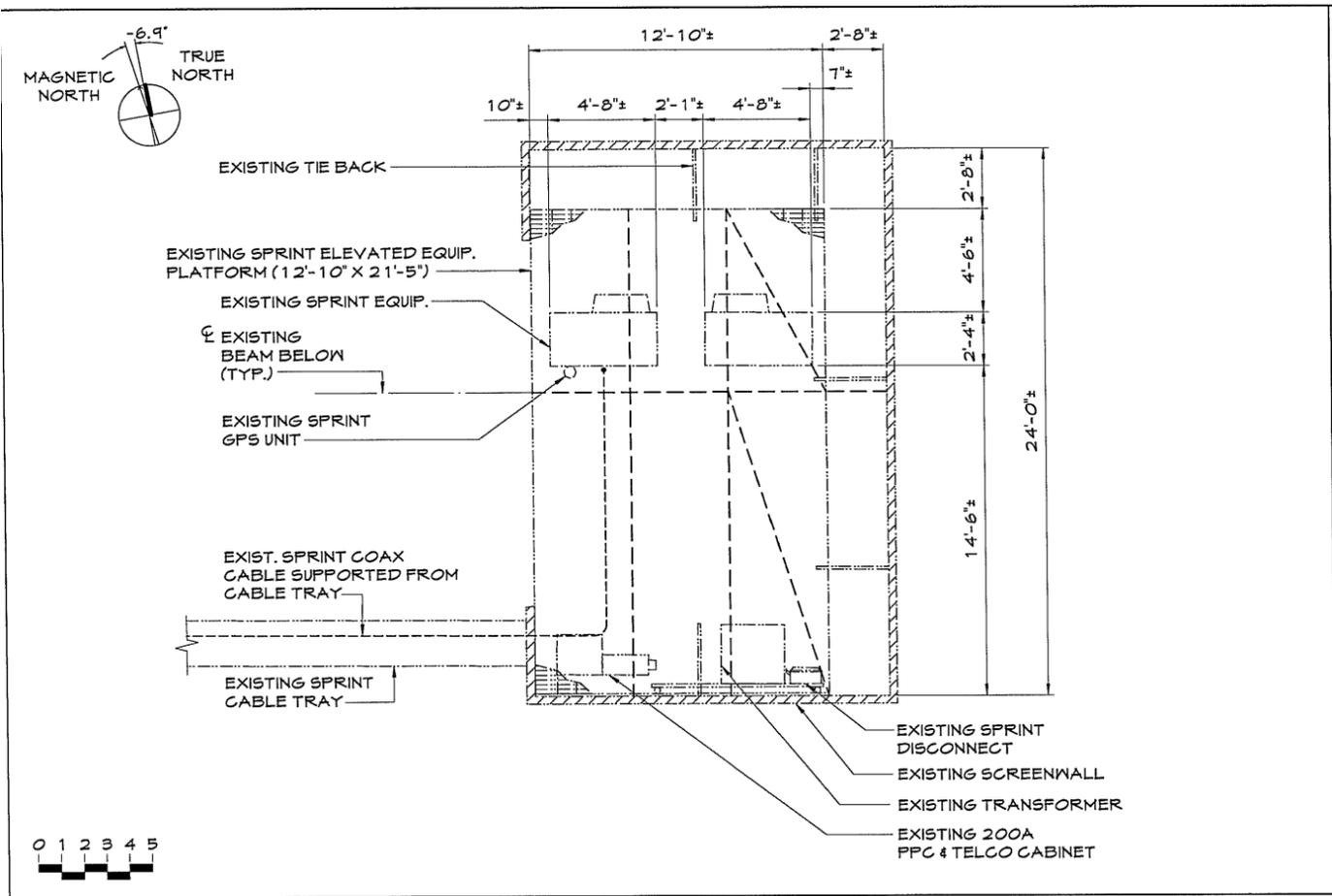
CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:

**BUILDING  
ROOF PLAN**





CABINET LOCATION TO BE CONFIRMED AGAINST STRUCTURAL ANALYSIS PERFORMED BY OTHERS

EXISTING SPRINT CDMA EQUIP. TO BE REMOVED DURING DECOMMISSIONING PHASE

ROUTE AND SECURE HYBRID CABLE UNDER EXISTING PLATFORM

CONTRACTOR TO CONFIRM FINAL LOCATION OF MMBS AND BBU W/ G.D. C.S. PRIOR TO CABINET DELIVERY

**Sprint**

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OVERLAND PARK, KS 66251  
PHONE: (913) 762-2000

**SAMSUNG**

**GENERAL DYNAMICS**  
Wireless Services

**HARPER ENGINEERING, INC.**  
TELECOM GROUP

815 Superior Ave. Suite 1514  
Cleveland, OH. 44114

Phone: (216) 344-3855  
Fax: (216) 344-3856

**DRAWING REVISIONS**

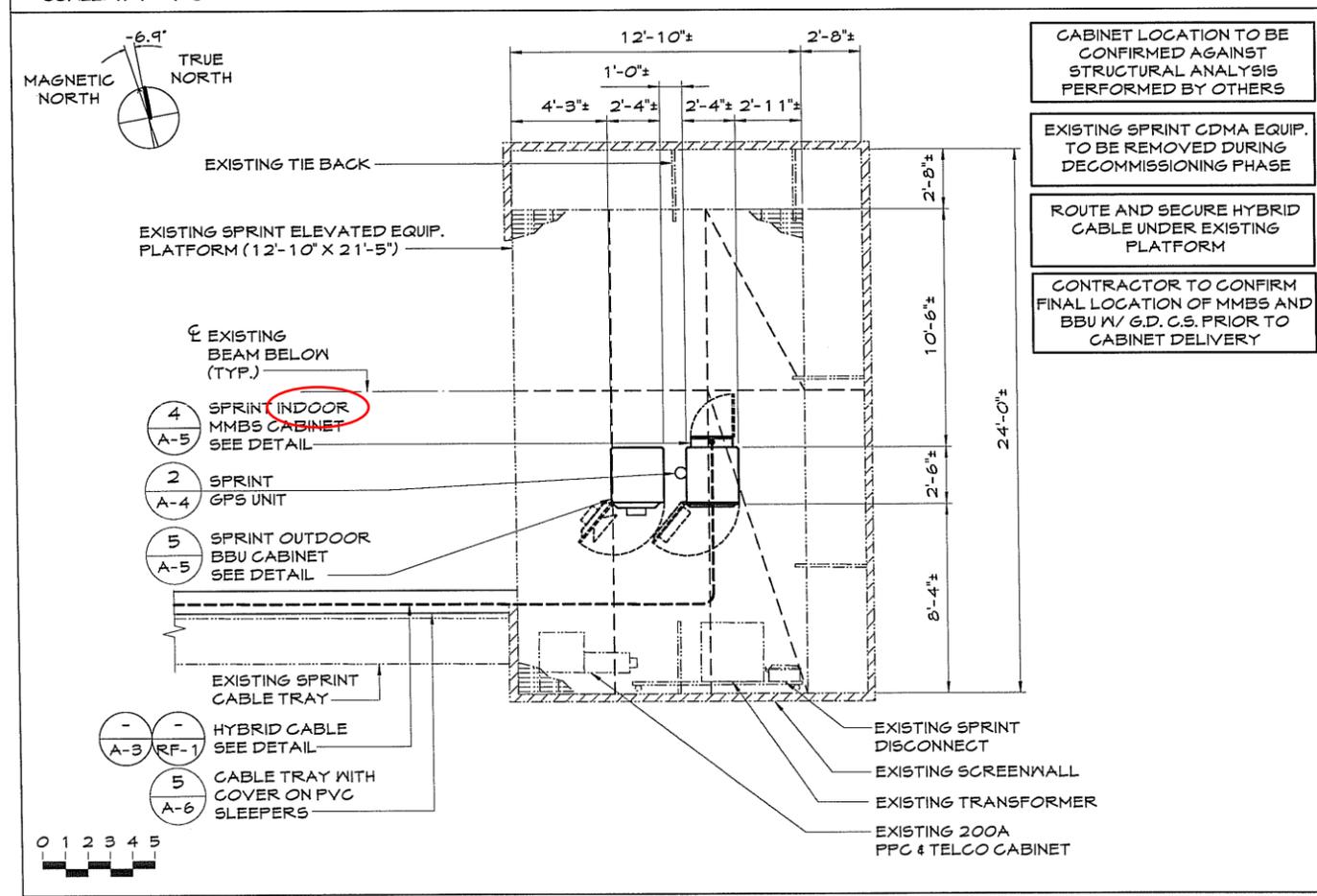
Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
O	For Construction	04/22/13	DWH

**1 EQUIPMENT ARRANGEMENT PLAN - EXISTING**

SCALE: 1/4" = 1'-0"

**2 EQUIPMENT ARRANGEMENT PLAN - INTERIM**

SCALE: 1/4" = 1'-0"



CABINET LOCATION TO BE CONFIRMED AGAINST STRUCTURAL ANALYSIS PERFORMED BY OTHERS

EXISTING SPRINT CDMA EQUIP. TO BE REMOVED DURING DECOMMISSIONING PHASE

ROUTE AND SECURE HYBRID CABLE UNDER EXISTING PLATFORM

CONTRACTOR TO CONFIRM FINAL LOCATION OF MMBS AND BBU W/ G.D. C.S. PRIOR TO CABINET DELIVERY

STATE OF OHIO  
DAVID W. HARPER  
REGISTERED PROFESSIONAL ENGINEER  
53819  
4-22-13  
Engineer's Seal

NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:  
**EQUIPMENT ARRANGEMENT PLANS**

**3 EQUIPMENT ARRANGEMENT PLAN - FINAL**

SCALE: 1/4" = 1'-0"

SHEET No./Rev.: **A-2/0**

SCALE: AS NOTED

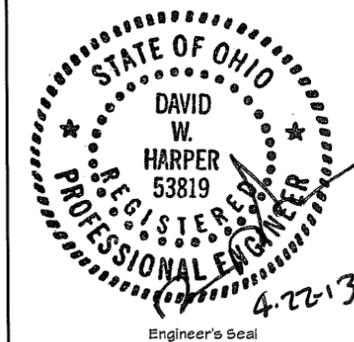
DRWN. BY: MCM

CHK'D. BY: MAD

Date: 02/06/13

cad file: 12-112-063

Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
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NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:

**ELEVATION &  
ANTENNA PLANS  
(ALL SECTORS)**

SHEET No./Rev.:

**A-3/0**

SCALE: AS NOTED  
DRWN. BY: MCM  
CHKD. BY: MAD  
Date: 02/06/13  
cad file: 12-172-063

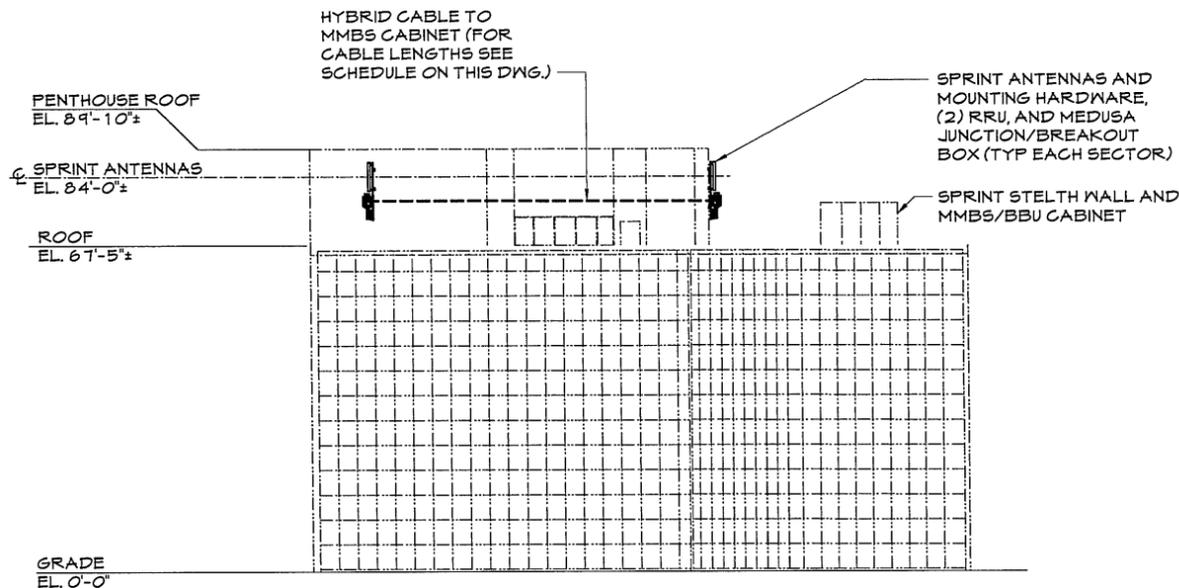
800/1900 EQUIPMENT

RRU / HYBRID CABLE SCHEDULE									
SECTOR	RRU MODEL	RRU FREQUENCY	HYBRID CABLE LENGTH	HYBRID CABLE DIAMETER	JUMPER SIZE	JUMPER LENGTH	RET LENGTH	RET CABLE MANUFACTURER	RET CABLE MODEL NUMBER
ALPHA	RRH-C2A & RRH-P4	(1)800MHZ & (1)1900MHZ	225'	1.18/1.25"	1/2"	6'	9.8'	COMMSCOPE	IRET AIS6V1.1
BETA	RRH-C2A & RRH-P4	(1)800MHZ & (1)1900MHZ	90'	0.98"	1/2"	6'	9.8'	COMMSCOPE	IRET AIS6V1.1
GAMMA	RRH-C2A & RRH-P4	(1)800MHZ & (1)1900MHZ	225'	1.18/1.25"	1/2"	6'	9.8'	COMMSCOPE	IRET AIS6V1.1

ANTENNA SCHEDULE									
SECTOR	ANTENNA FREQUENCY	ANTENNA MFR.	ANTENNA MODEL	ANTENNA QUANTITY	AZIMUTH	RAD CENTER	ANT. SIZE	ELECT TILT 800/1900	MECH TILT 800/1900
ALPHA	800/1900 MHZ	KMN	ET-X-TS-70-15-62-18-IR-RD	1 (PER SECTOR)	15°	84'-0"	73.8"	0°/-2'	0'
BETA	800/1900 MHZ	KMN	ET-X-TS-70-15-62-18-IR-RD	1 (PER SECTOR)	135°	84'-0"	73.8"	-6°/-1'	0'
GAMMA	800/1900 MHZ	KMN	ET-X-TS-70-15-62-18-IR-RD	1 (PER SECTOR)	240°	84'-0"	73.8"	-4°/-1'	0'

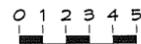
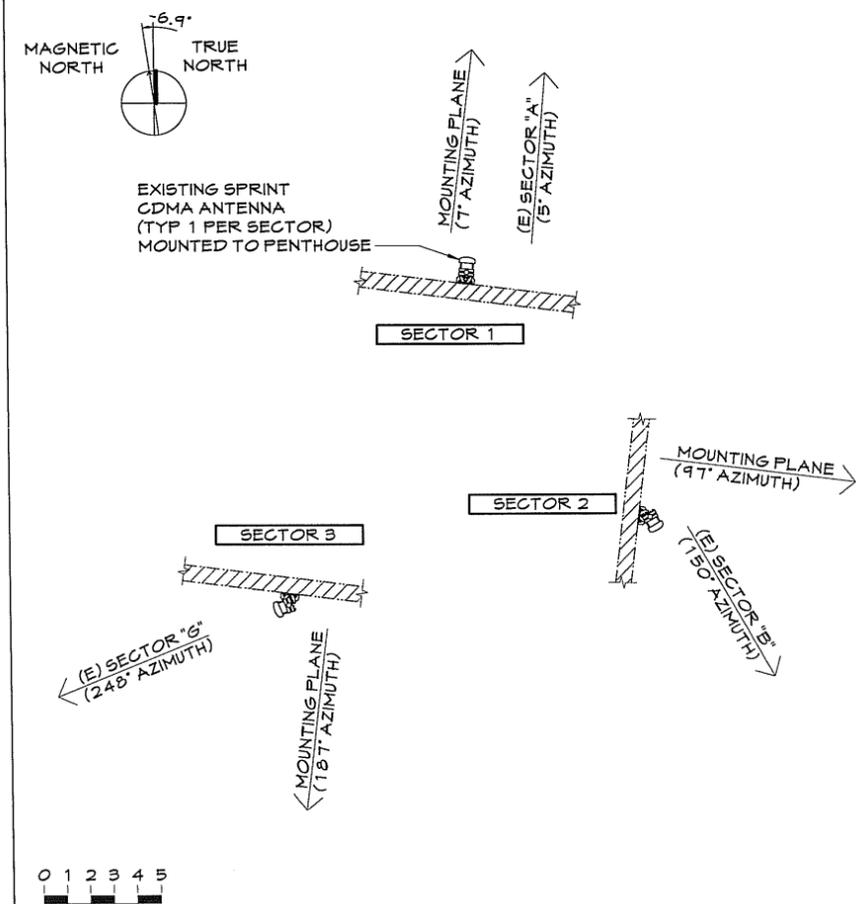
NOTES:

- STRUCTURAL ANALYSIS MUST BE PERFORMED ON ALL ROOFTOPS, FLAGPOLES AND TOWER SITES BEFORE INSTALLATION OF ANTENNAS, RRUs, & CABINETS/TEMPORARY PLATFORM. STRUCTURAL ANALYSIS TO BE PROVIDED BY OTHERS.
- EXISTING ANTENNAS ARE CDMA UNLESS NOTED OTHERWISE.
- NEW SPRINT ANTENNAS INCLUDE THE RRUs WHICH SHALL BE MOUNTED ON THE PIPE BEHIND THE ANTENNA AS SHOWN ON DRAWINGS.
- FIELD VERIFY EXISTING AZIMUTHS AND VERIFY WITH SPRINT REPRESENTATIVE BEFORE RELOCATING THE ANTENNAS.
- ALL AZIMUTHS ARE TO BE ESTABLISHED CLOCKWISE FROM THE TRUE NORTH HEADING. CONTRACTOR SHALL VERIFY NEW ANTENNA'S RAD CENTER, AZIMUTHS AND ORIENTATIONS WITH SPRINT PCS/EBTS PRIOR TO INSTALLATION OF ANTENNAS.
- ANTENNAS ARE TO BE INSTALLED AND COAX ROUTED IN ACCORDANCE TO STRUCTURAL ANALYSIS PERFORMED BY OTHERS. THIS INCLUDES THE REINFORCING OF ANTENNA MOUNTS, THE ADDITION OF BALLAST FOR NON-PENETRATION SLEDS AND/OR ANY OTHER STRUCTURAL RECOMMENDATIONS PER THE STRUCTURAL ANALYSIS REPORT.



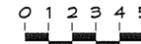
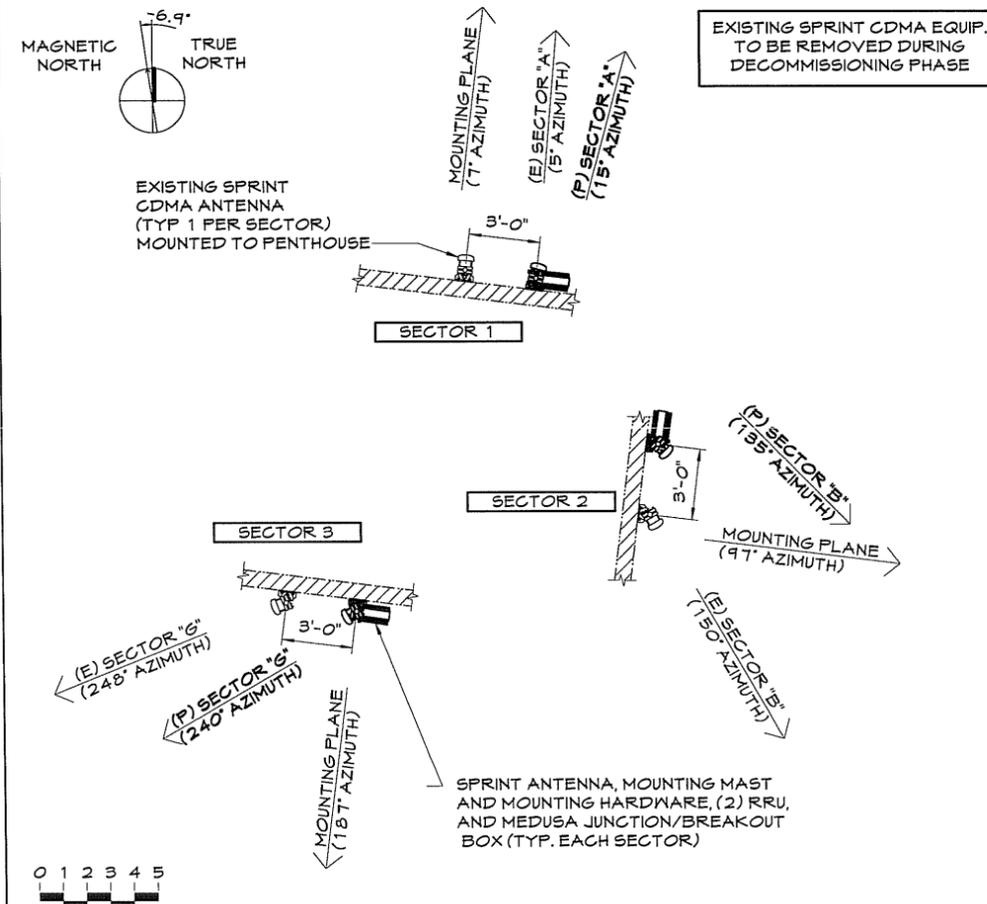
**1 ELEVATION**

SCALE: 1" = 20'-0"



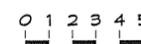
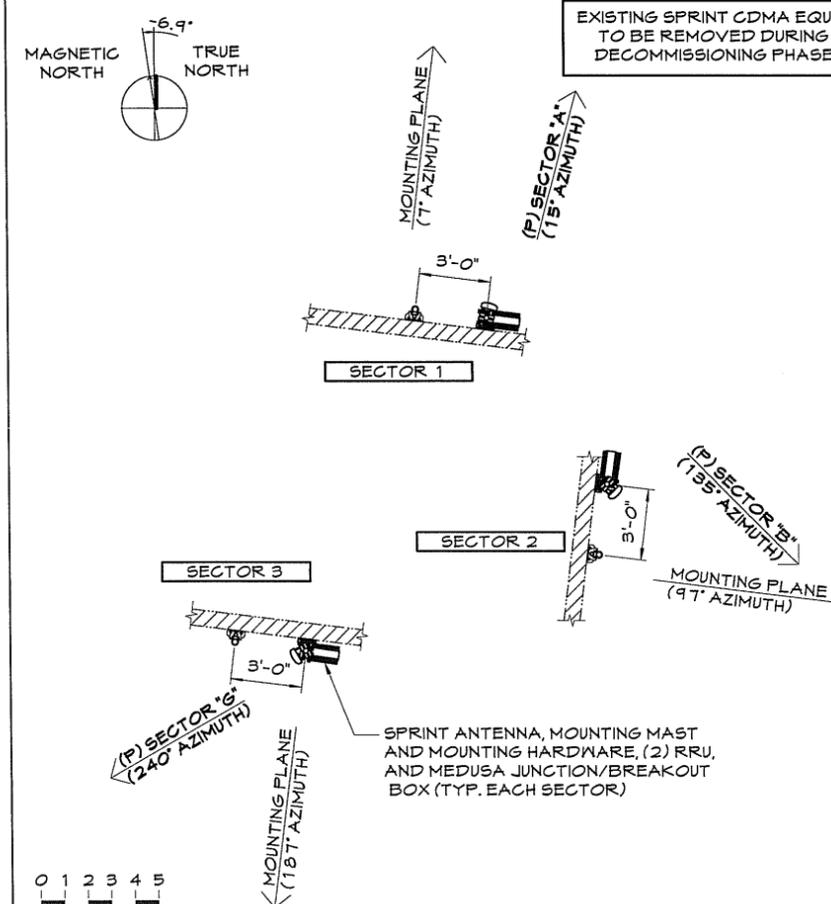
**2 ANTENNA PLAN (EXISTING)**

SCALE: 1/4" = 1'-0"



**3 ANTENNA PLAN (INTERIM)**

SCALE: 1/4" = 1'-0"



**4 ANTENNA PLAN (FINAL)**

SCALE: 1/4" = 1'-0"

**DRAWING REVISIONS**

Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
O	For Construction	04/22/13	DWH



Engineer's Seal

NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:

**EQUIPMENT DETAILS**

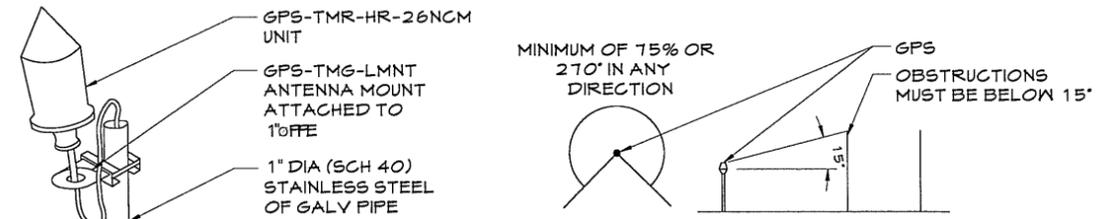
SHEET No./Rev.: SCALE: AS NOTED

DRWN. BY: MCM

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Date: 02/06/13

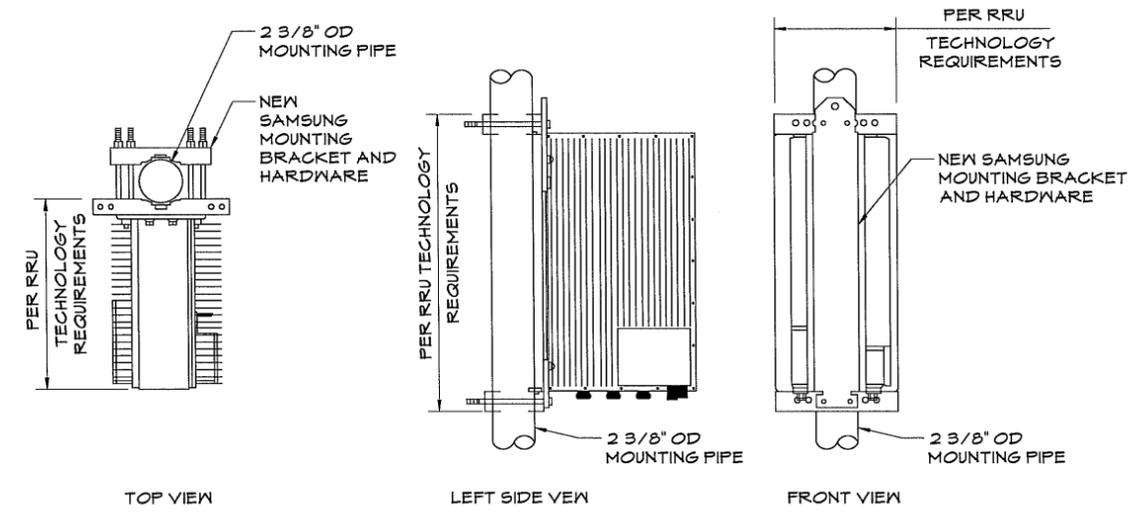
cad file: 12-112-065



- NOTES**
1. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1"Ø, SCH. 40, GALVANIZED STEEL OF STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MIN. OF 18", 8'-0" IF MOUNTING TO NEW MMBS-BBU) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED.
  2. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF VERTICAL AND THE BASE OF THE ANTENNA IS WITHIN 2' OF LEVEL.
  3. DO NOT SWEEP TEST GPS ANTENNA
  4. ATTACH GPS MOUNTING PIPE TO NEW MMBS USING (4) 8MMx15MM SS BOLTS AND (4) 1" PIPE STRAPS. GPS TO BE MOUNTED A MIN. OF 2'-0" ABOVE MMBS CABINET.

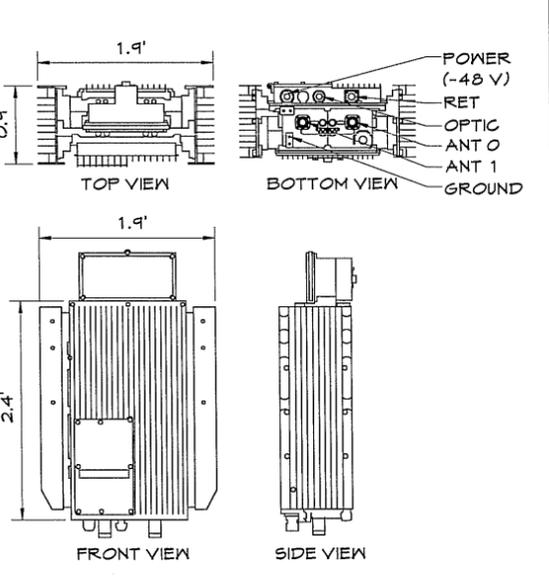
**2 GPS UNIT PIPE MOUNT & REQUIREMENTS**

SCALE: NTS



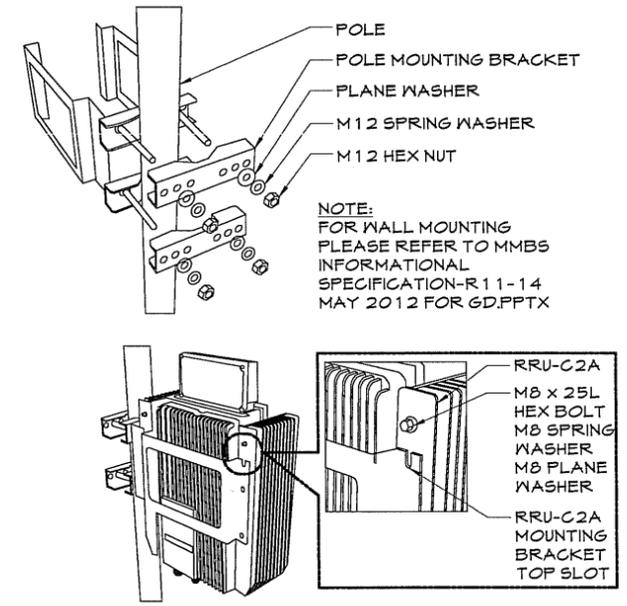
**3 RRU POLE INSTALLATION DETAIL**

SCALE: NTS



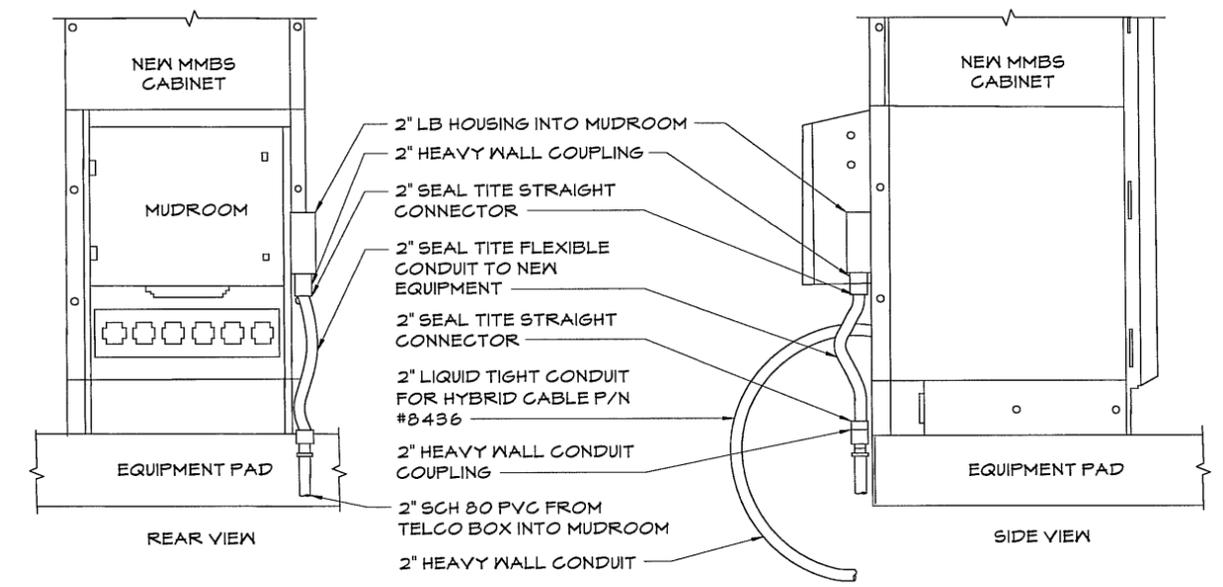
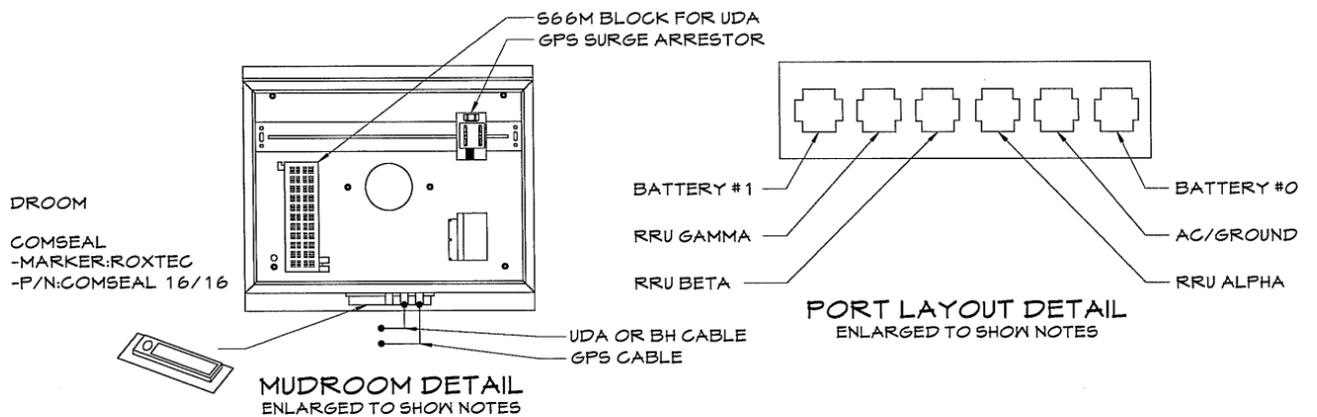
**6 800 MHz RRU-C2A**

SCALE: NTS



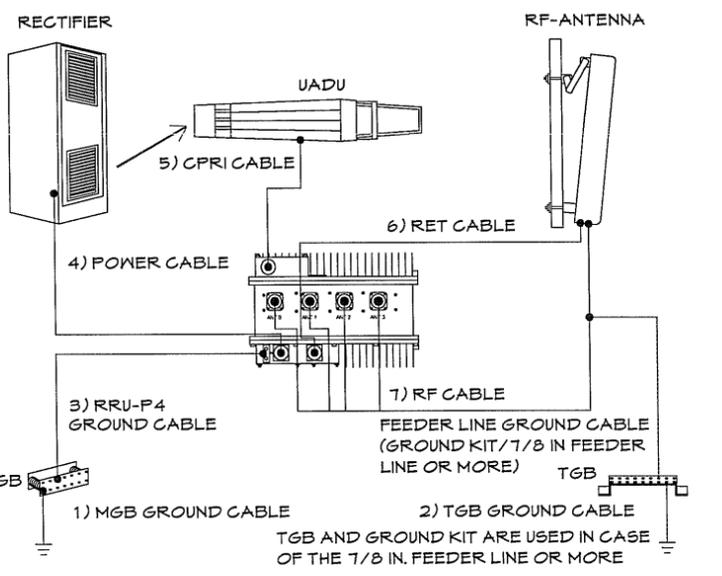
**7 800 MHz RRU 2ND GEN POLE MOUNT**

SCALE: NTS



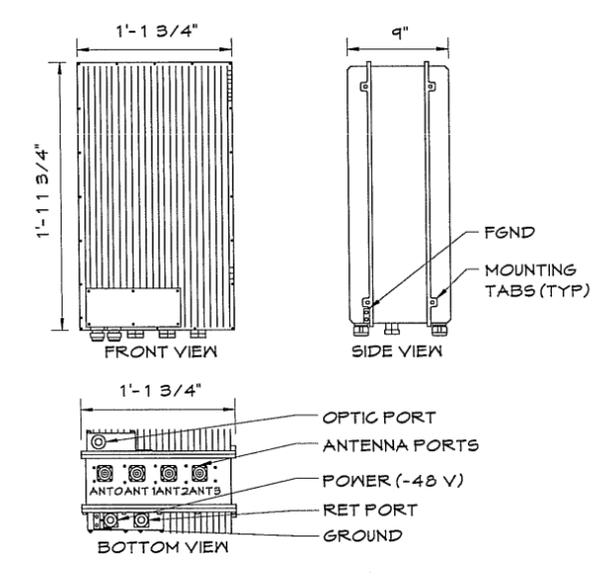
**1 HYBRID AND TELCO LINE SUPPORT DETAILS**

SCALE: NTS



**4 SAMSUNG MMBS WIRING DIAGRAM**

SCALE: NTS

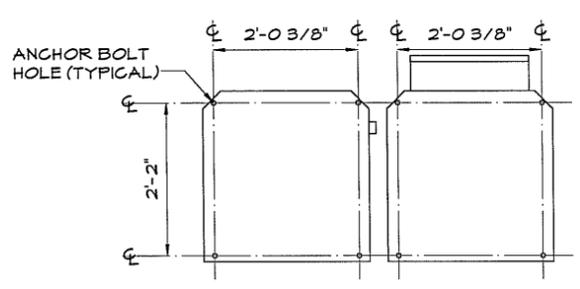
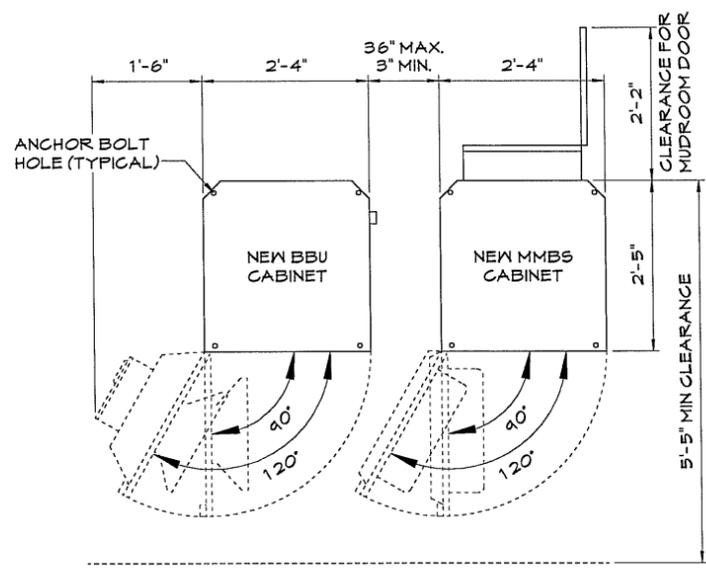


**5 1900 MHz RRU-P4 MECHANICAL SPECIFICATIONS**

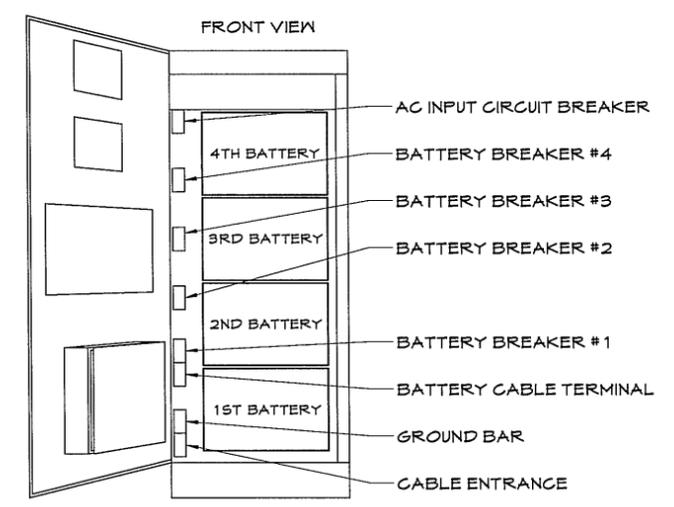
SCALE: NTS

**800 MHz RRU 2ND GEN POLE MOUNT**

SCALE: NTS



ITEM	SPECIFICATIONS
CAPACITY	MAX 4 BATTERY STRINGS
COOLING	AIR-CONDITIONER/COOLING WITH FAN FOR EMERGENCY MODE (MCLEAN T20 HVAC)
SOUND LEVEL	65BA@1.5m
SIZE	71 (H) X 41.25 (D) X 27.6 (W) INCH 1800 (H) X 1048 (D) X 700 (W) mm
CABINET WEIGHT	370 LBS
PER BATTERY STRING WEIGHT	529 LBS
BATTERY	NARADA 190AH (12NDT 190) AGM TYPE (VRLA)
AC POWER	220VAC, 3.5AMP TYP 14.4AMP STARTING
DC POWER	10A MAX @ 48 DVC



1 MMBS & BBU TYPICAL LAYOUT

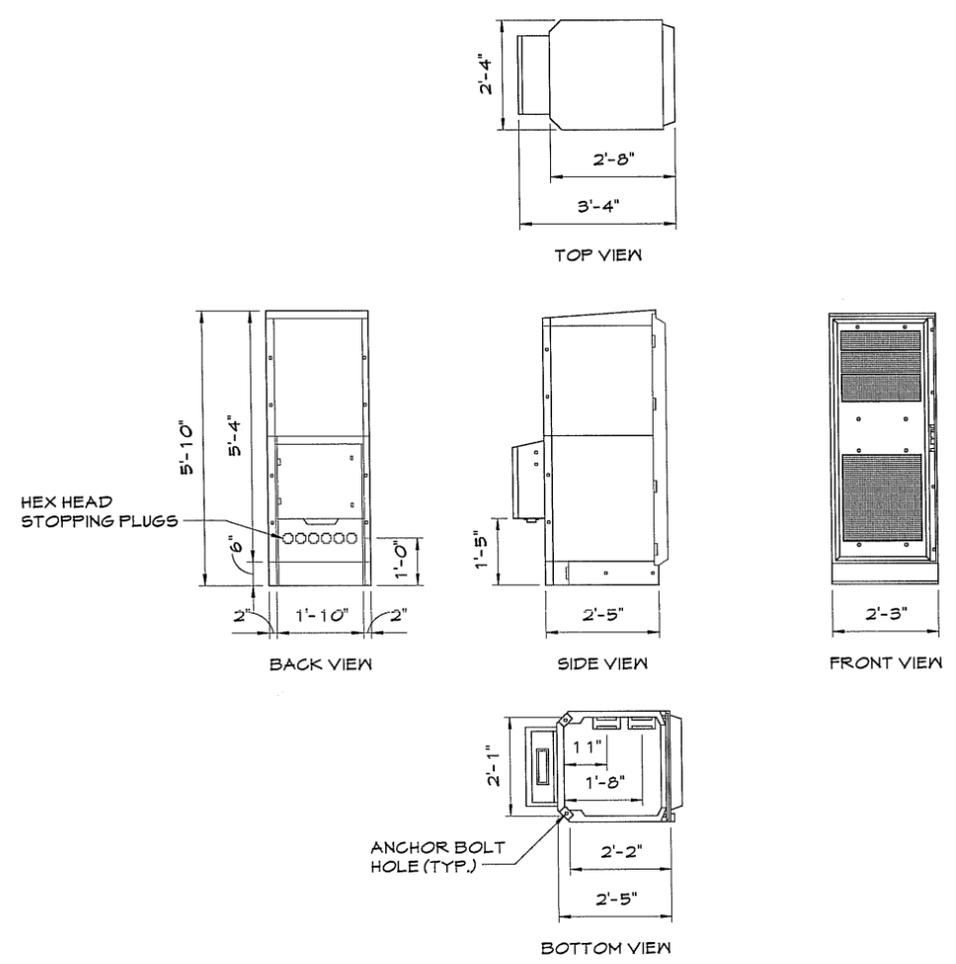
2 ANCHOR BOLT LAYOUT

3 BBU CABINET

SCALE: NTS

SCALE: NTS

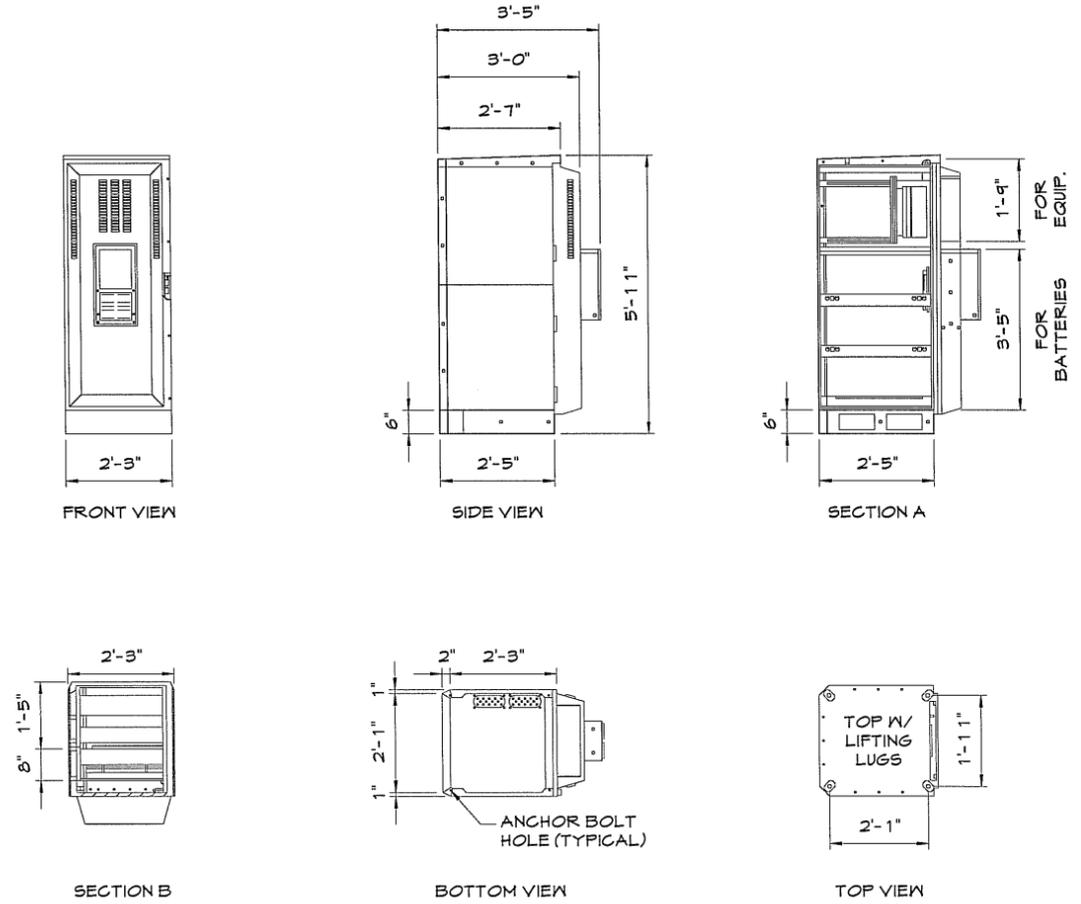
SCALE: NTS



MMBS EQUIPMENT WEIGHT & DIMENSIONS	
MMBS CABINET	1800x700x1018 (820)mm/70.8in x 29.5in x 40.1(37.0)in
MMBS CABINET	251kg (553lbs) W/O DU SHELF   300kg WITH 4 DU SHELF

4 MMBS MECHANICAL SPECIFICATIONS

SCALE: NTS



BBU EQUIPMENT WEIGHT & DIMENSIONS	
BBU CABINET	1800x700x1018 (820)mm/70.8in x 29.5in x 40.1(37.0)in
BBU CABINET	168kg (370lbs) W/O BATTERY   1136kg WITH BATTERY

5 BBU MECHANICAL SPECIFICATIONS

SCALE: NTS



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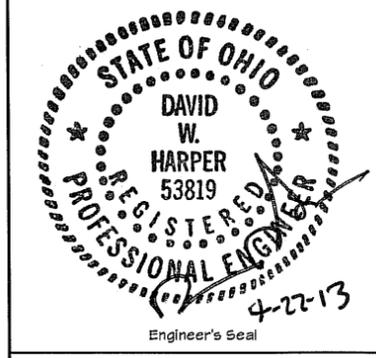


GENERAL DYNAMICS  
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DRAWING REVISIONS			
Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
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NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE  
CB33XC147  
425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

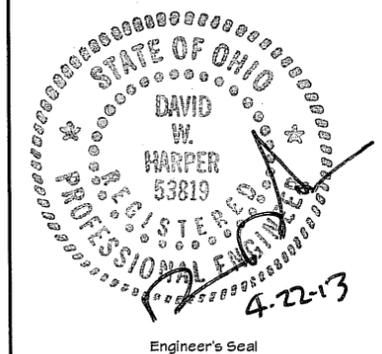
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**EQUIP. DETAILS  
(OUTDOOR  
SPECIFICATIONS)**

SHEET No./Rev.:  
**A-5/0**

SCALE: AS NOTED  
DRWN. BY: MCM  
CHKD. BY: MAD  
Date: 02/06/13  
cad file: 12-172-069

**DRAWING REVISIONS**

Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
0	For Construction	04/22/13	DWH



NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO  
PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

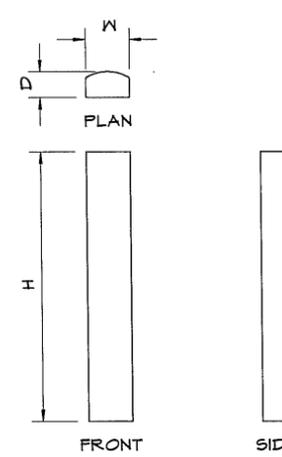
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**EQUIPMENT  
DETAILS**

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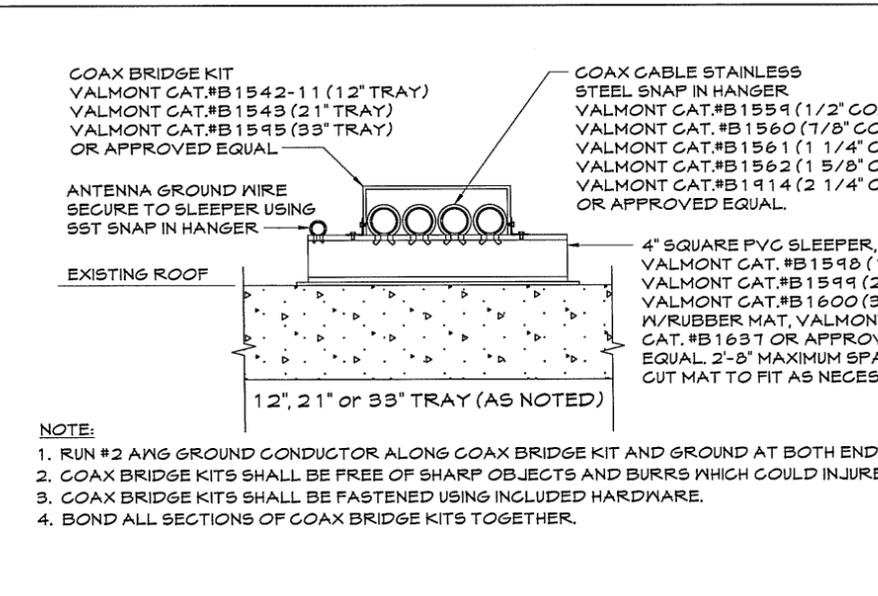
**A-6/0**

SCALE: AS NOTED  
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CHKD. BY: MAD  
Date: 02/06/13  
cad file: 12-172-065

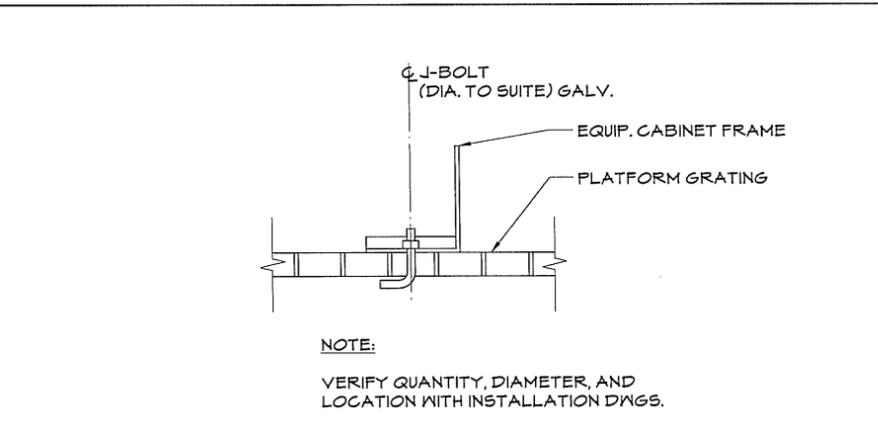


MANUF.: KMM  
MODEL: ET-X-T5-70-15-62-18-IR-RD  
LENGTH: 73.8"  
WIDTH: 11.8"  
DEPTH: 5.9"  
WEIGHT: 41.9 lbs  
AREA: 0 SF

**1 ANTENNA SPECIFICATIONS - 800/1900 MHZ**

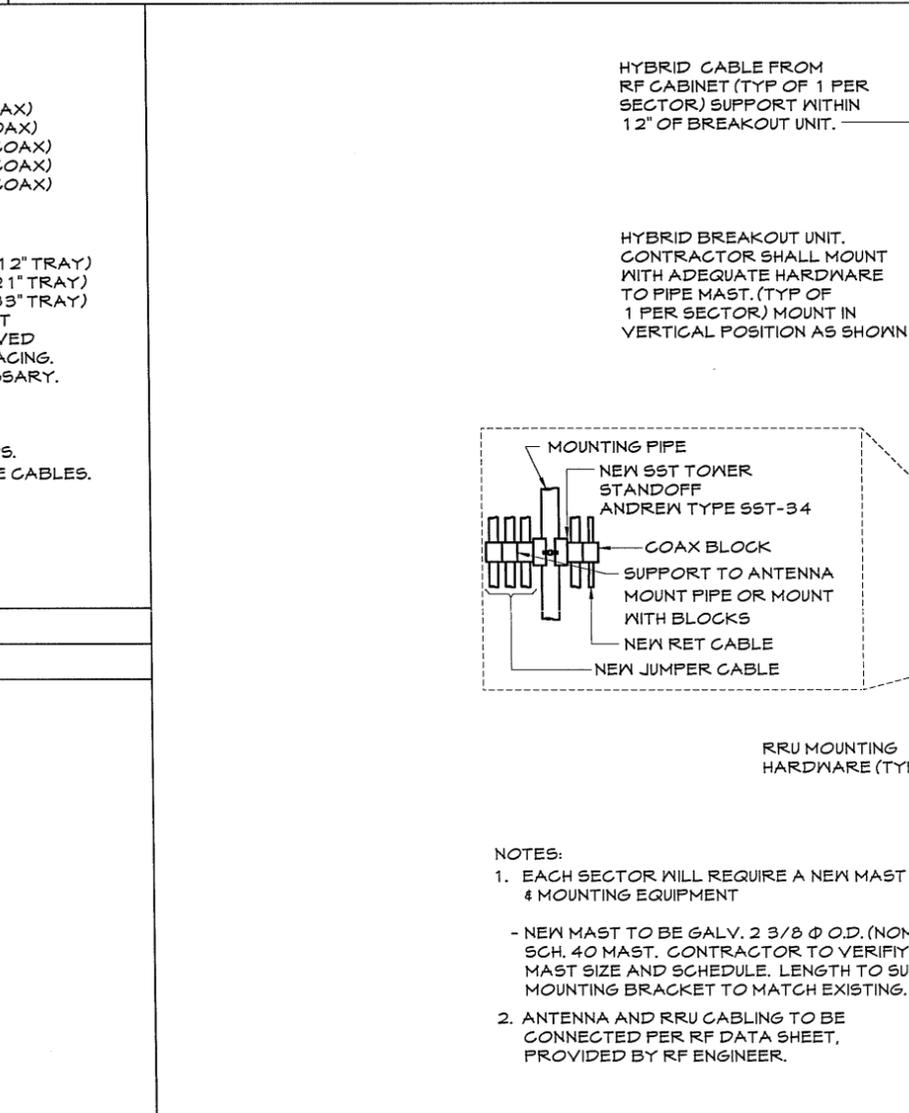


**5 CABLE TRAY DETAIL**



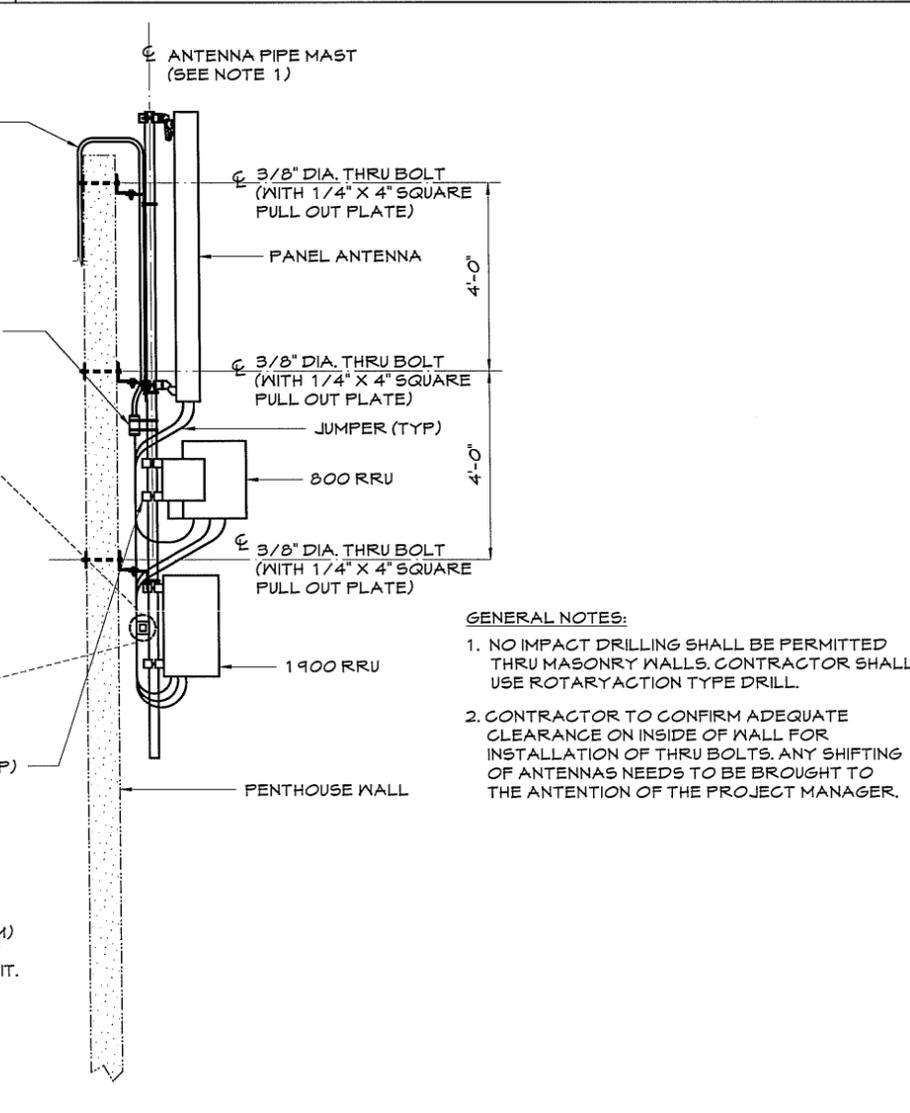
**6 CABINET ANCHOR DETAIL - PLATFORM**

**2 NOT USED**

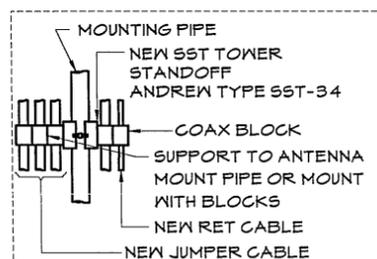


**7 ANTENNA MOUNTING DETAIL 800 & 1900 RRU**

**3 NOT USED**



**4 ANTENNA MOUNTING DETAIL 800 & 1900 RRU**



NOTES:  
1. EACH SECTOR WILL REQUIRE A NEW MAST & MOUNTING EQUIPMENT  
  
- NEW MAST TO BE GALV. 2 3/8" Ø O.D. (NOM) SCH. 40 MAST. CONTRACTOR TO VERIFY MAST SIZE AND SCHEDULE. LENGTH TO SUIT. MOUNTING BRACKET TO MATCH EXISTING.  
2. ANTENNA AND RRU CABLEING TO BE CONNECTED PER RF DATA SHEET, PROVIDED BY RF ENGINEER.

GENERAL NOTES:  
1. NO IMPACT DRILLING SHALL BE PERMITTED THRU MASONRY WALLS. CONTRACTOR SHALL USE ROTARY ACTION TYPE DRILL.  
2. CONTRACTOR TO CONFIRM ADEQUATE CLEARANCE ON INSIDE OF WALL FOR INSTALLATION OF THRU BOLTS. ANY SHIFTING OF ANTENNAS NEEDS TO BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER.

TYPICAL HYBRID CABLE COLOR CODE			
SECTOR	FIRST RING	SECOND RING	THIRD RING
A	GREEN	NO TAPE	NO TAPE
B	GREEN	GREEN	NO TAPE
G	GREEN	GREEN	GREEN

FREQUENCY COLOR CODE FOR PAIRS AND FIBER CABLES OF HYBRID CABLE

FREQUENCY COLOR CODE	FIRST RING	SECOND RING
800 MHZ	YELLOW	GREEN
1900 MHZ	YELLOW	RED

TYPICAL JUMPER CABLE COLOR CODE

FREQUENCY	ANTENNA PORT	RRU PORT	CABLE COLOR
800 MHZ	RET	RET	N/A
	800 MHZ +45°	ANT 1	WHITE
	800 MHZ -45°	ANT 0	BLUE
1900 MHZ	PCS1 -45°	ANT 0	BLUE
	PCS1 +45°	ANT 1	WHITE
	PCS2 -45°	ANT 2	GREEN
	PCS2 +45°	ANT 3	BROWN
	RET	RET	RED

1 HYBRID AND JUMPER CABLES COLOR CODING

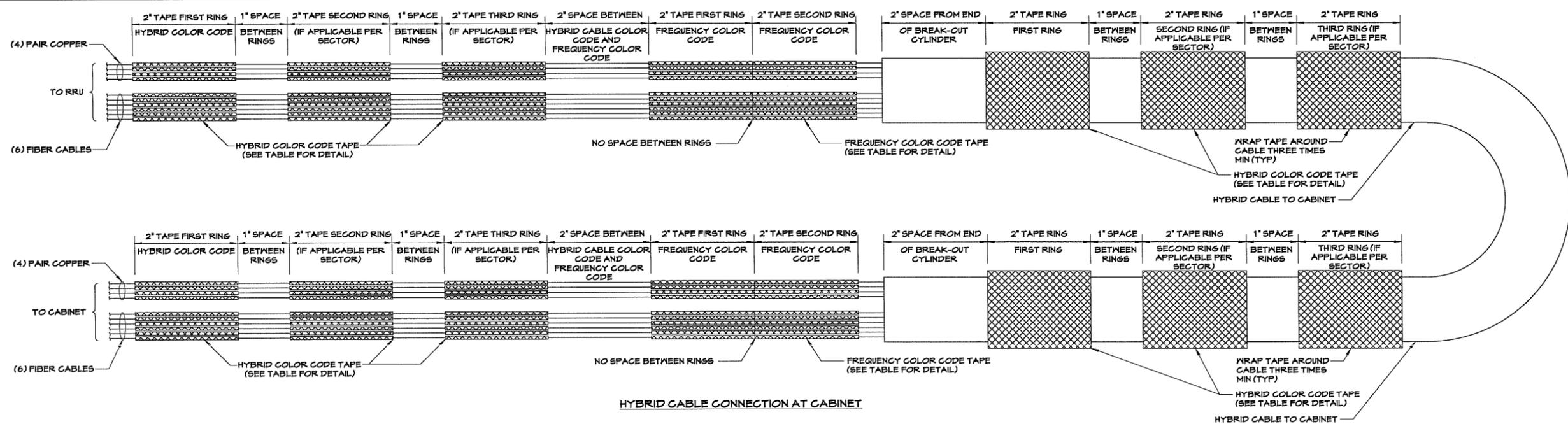
SUPPLIER	TYPE	SAMSUNG FIBEROPTICS				ASIA TAI			
		LENGTH (FT)	TOTAL WEIGHT (KG)	WEIGHT/LF (LBS)	WEIGHT/LF (KG)	TOTAL WEIGHT (KG)	WEIGHT/LF (LBS)	WEIGHT/LF (KG)	WEIGHT/LF (LBS)
TYPE 1	60	13	28	0.2	0.5	19	41	0.3	0.7
	75	16	35	0.2	0.5	22	49	0.3	0.7
	90	19	42	0.2	0.5	26	57	0.3	0.7
	105	30	66	0.3	0.6	29	65	0.3	0.7
	120	34	75	0.3	0.6	33	73	0.3	0.7
TYPE 2	135	38	85	0.3	0.6	46	101	0.3	0.7
	150	43	94	0.3	0.6	51	112	0.3	0.7
	165	47	104	0.3	0.6	55	122	0.3	0.7
	180	69	151	0.4	0.8	72	160	0.3	0.7
TYPE 3	195	75	164	0.4	0.8	78	173	0.3	0.7
	210	80	177	0.4	0.8	85	187	0.3	0.7
	225	89	196	0.4	0.9	102	224	0.3	0.7
TYPE 4	240	95	209	0.4	0.9	109	239	0.3	0.7
	255	101	222	0.4	0.9	115	254	0.3	0.7
	270	133	293	0.5	1.1	122	270	0.3	0.7
TYPE 5	285	141	310	0.5	1.1	152	335	0.3	0.7
	300	148	326	0.5	1.1	160	353	0.3	0.7
	315	155	342	0.5	1.1	168	371	0.3	0.7
TYPE 6	330	163	359	0.5	1.1	176	388	0.3	0.7
	350	171	377	0.5	1.1	184	406	0.3	0.7

	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6	TYPE 7
TOTAL LENGTH	TL<105'	105<TL<180'	180<TL<225'	225<TL<270'	270<TL<345'	TL<420'	TL<550'
HYBRID POWER CABLE CONFIGURATION	AWG 10 1 PAIR, AWG 12 3 PAIR	AWG 8 1 PAIR, AWG 10 3 PAIR	AWG 6 1 PAIR, AWG 8 1 PAIR, AWG 10 2 PAIR	AWG 6 1 PAIR, AWG 8 3 PAIR	AWG 4 1 PAIR, AWG 6 1 PAIR, AWG 8 2 PAIR	AWG 4 1 PAIR, AWG 6 3 PAIR	AWG 2 1 PAIR, AWG 4 3 PAIR
CABLE DIAMETER	0.98"	1.06"	1.18"	1.18"/1.25"	1.25"	1.56"	1.69"
BENDING RADIUS	11.81"	12.99"	15.35"	17.71"	17.71"	18.00"/30.00"	21.00"/35.00"
OPTIC CABLE	LC/PC-to-LC/PC, SINGLE MODE						
DU CABINET (POWER CABLE TERMINAL MAX SIZE AWG 4)	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE						
RRU POWER CABLE SPEC	AWG 8, 0.57"-0.60" AWG 10, 0.45"-0.48"					8 AWG CABLES 4 PAIRS	
NON USE POWER AND OPTIC CABLE PROTECTION	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE

SUPPLIER	TESSCO	
TYPE	LENGTH (FT)	TOTAL WEIGHT (KG) (LBS)
TYPE 6	1	0.73 1.6
	1000	732 1613
TYPE 7	1	1 2.2
	1000	1006 2218
	550	553 1220

NOTE:  
CONTACT G.D. CONSTRUCTION SUPERVISOR FOR LATEST COLOR CODING. SEE TS-200, SPRINT ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS

2 HYBRID CABLE TYPE



- NOTES:
- ALL CABLES SHALL BE MARKED AT THE TOP AND BOTTOM WITH 2" COLORED TAPE OR STENCIL TAG. COLOR TAPE SHALL BE OBTAINED FROM GRAYBAR ELECTRIC.
  - THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM AN END CONNECTOR, WEATHERPROOFING, OR BREAK-OUT CYLINDER, WITH 1" SPACE BETWEEN EACH RING.
  - THE HYBRID CABLE COLOR SHALL BE APPLIED IN ACCORDANCE WITH THE "TYPICAL HYBRID CABLE COLOR CODE" TABLE ABOVE FOR THE RESPECTIVE SECTOR.
  - INDIVIDUAL POWER PAIRS AND FIBER CABLES SHALL BE LABELED WITH BOTH THE HYBRID CABLE COLOR FOR THE RESPECTIVE SECTOR AND A FREQUENCY COLOR CODE IN ACCORDANCE WITH THE "FREQUENCY COLOR CODE FOR PAIRS AND FIBER CABLES OF HYBRID CABLE" TABLE ABOVE.
  - A 2" GAP SHALL SEPARATE THE HYBRID CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE.
  - THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
  - THE 2" COLORED TAPE(S) SHALL EACH BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE HYBRID CABLE OR INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
  - COLOR BAND ON JUMPERS SHALL BE 2" WIDE WITH A 2" SPACE.

3 HYBRID CABLE COLOR SCHEME DETAIL



6550 SPRINT PARKWAY  
OVERLAND PARK, KS 66251  
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Fax: (216) 344-3856

DRAWING REVISIONS

Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
0	For Construction	04/22/13	DWH



NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE  
CB33XC147  
425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:  
ANTENNA &  
CABLE COLOR  
CODING DETAILS

SHEET No./Rev.:  
SCALE: AS NOTED  
DRNN BY: MCM  
CHKD BY: MAD  
Date: 02/06/13  
cad file: 12-172-068

RF-1/0

**ELECTRICAL NOTES:**

- ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
- IF NECESSARY, CONTRACTOR SHALL COORDINATE WITH LOCAL POWER COMPANY FOR UPGRADE OF SERVICE LINE TO THE METER BASE, SEE SINGLE LINE DIAGRAM FOR SERVICE AMPERAGE. IF UPGRADE FROM EXISTING AMPERAGE IS NECESSARY, POWER SERVICE IS COMMERCIAL, AC NOMINAL, 200A, 120/208V OR 120/240V, SINGLE PHASE.
- CONTRACTOR SHALL COORDINATE WITH LOCAL TELEPHONE COMPANY FOR SERVICE LINE REQUIREMENTS TO TERMINATE AT THE SPRINT TELCO CABINET.
- IF SERVICE UPGRADE IS NECESSARY, CONTRACTOR SHALL FURNISH AND INSTALL ELECTRIC METER BASE AND 200A DISCONNECT SWITCH PER DESIGN DRAWINGS AND PER LOCAL UTILITY COMPANY SPECIFICATIONS. THE METER BASE SHOULD BE LOCATED IN A MANNER WHERE ACCESSIBLE BY THE LOCAL POWER COMPANY.
- IF SERVICE UPGRADE IS NECESSARY, LOCAL POWER COMPANY SHALL PROVIDE 200 AMP ELECTRIC METER. CONTRACTOR SHALL COORDINATE INSTALLATION OF METER WITH LOCAL POWER COMPANY.
- UNDERGROUND POWER AND TELCO SERVICE LINES SHALL BE ROUTED IN A COMMON TRENCH. ALL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 AND CONDUIT EXPOSED ABOVE GROUND SHALL BE GALVANIZED RIGID STEEL TUBING UNLESS OTHERWISE INDICATED.
- ALL TELCO CONDUITS SHALL BE 4" SCHEDULE 40 PVC UNLESS NOTED OTHERWISE. THE TELCO CONDUIT FROM THE PPC SHALL BE ROUTED AND TERMINATED AT DESIGNATED TELCO DEMARCATION POINT, OR 2-FEET OUTSIDE FENCED AREA, OR NEAR UTILITY POLE, CAP OFF CONDUIT AND PROVIDE MARKER STAKE PAINTED BRIGHT ORANGE WITH DESIGNATION FOR TELCO SERVICE.
- CONDUITS INSTALLED AT PCS EQUIPMENT, PRIOR TO THE EQUIPMENT INSTALLATION, SHALL BE STUBBED AND CAPPED AT 6" ABOVE GRADE, PAD OR PLATFORM. IF SERVICE LINES CAN'T BE INSTALLED INITIALLY, PROVIDE NYLON PULL CORD IN CONDUITS.
- THE SPRINT CABINET, INCLUDING 200 AMP LOAD PANEL AND TELCO PANEL, SHALL BE PROVIDED BY OWNER AND INSTALLED BY THE CONTRACTOR. CONTRACTOR IS TO INSTALL BREAKER(S) NOT PROVIDED BY MANUFACTURER. SEE PANEL SCHEDULE ON THIS SHEET FOR BREAKER REQUIREMENTS.
- LOCATION OF ELECTRIC METER AND DISCONNECT SWITCH TO BE PROVIDED BY GENERAL CONTRACTOR.
- CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION. CHANGE ORDERS WILL NOT BE ALLOWED AFTER THE CONTRACT HAS BEEN AWARDED.
- LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO ROUGH-IN.
- THE CONDUIT RUNS AS SHOWN ON THE PLANS ARE APPROXIMATE. EXACT LOCATION AND ROUTING SHALL BE PER EXISTING FIELD CONDITIONS.
- PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.

**ELECTRICAL NOTES (CONT)**

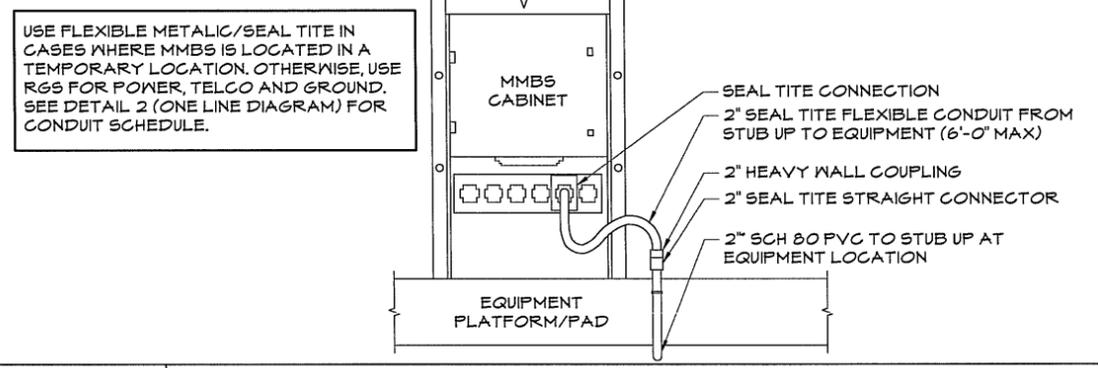
- ALL CONDUIT BENDS SHALL BE MADE IN ACCORDANCE WITH THE NEC. NO RIGHT ANGLE DEVICE OTHER THAN STANDARD CONDUIT ELBOWS WITH MINIMUM INSIDE SWEEPS PER NEC CHAPTER 9 TABLE 2 FOR ALL CONDUITS 2" OR LARGER.
- ALL CONDUIT TERMINATIONS SHALL BE PROVIDED WITH PLASTIC THROAT INSULATING GROUNDING BUSHINGS.
- ALL BRANCH CIRCUIT WIRE SHALL BE TYPE THWN, SOLID ANNEALED COPPER UP TO SIZE 8 AWG (6 AWG AND LARGER SHALL BE CONCENTRIC STRANDED), 75 DEGREE C, (167 DEGREES F), 98' CONDUCTIVITY, MINIMUM #12 AWG.
- ALL WIRES SHALL BE TAGGED AT ALL PULL BOXES, J-BOXES, EQUIPMENT BOXES AND CABINETS, WITH APPROVED PLASTIC TAGS, ACTION GRAFT, BRADY, OR APPROVED EQUAL.
- ALL NEW MATERIAL SHALL HAVE A UL LABEL.
- CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH MECHANICAL CONTRACTOR EQUIPMENT LOCATION AND COMPLY AS REQUIRED.
- ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN NOT HAND WRITTEN.
- INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND THE NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULLBOXES, DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.
- THE CONTRACTOR SHALL PREPARE AS-BUILT DRAWINGS AND DOCUMENT ANY AND ALL WIRING AND EQUIPMENT CONDITIONS AND CHANGES WHILE COMPLETING THIS CONTRACT. SUBMIT AT INSTALLATION COMPLETION.
- ALL DISCONNECT SWITCHES AND OTHER CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED, AND POWER PANEL NAME AND LOCATION (NO EXCEPTIONS.) PROVIDE SAMPLE FOR CONSTRUCTION MANAGER'S APPROVAL.
- ALL ELECTRICAL DEVICES AND INSTALLATIONS OF THE DEVICES SHALL COMPLY WITH (ADA) AMERICANS WITH DISABILITIES ACT AS ADOPTED BY THE APPLICABLE STATE.
- PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS OR RISERS THROUGH BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS WITHOUT CONSTRUCTION MANAGERS APPROVAL. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE PACKED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FILL FOR FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.
- ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNER'S REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN OF CONDUIT AND WIRE. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT (THE DESIGN OF THESE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN AND SOME EQUIPMENT CHARACTERISTICS MAY VARY FROM DESIGN AS SHOWN ON THESE DRAWINGS).
- LOCATION OF ALL OUTLET, BOXES, ETC., AND THE TYPE OF CONNECTION (PLUG OR DIRECT) SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.
- FOR GENERAL NOTES SEE DRAWINGS N-1 AND N-2.

SITE NUMBER: CB33XC 147	MANUFACTURER: NORTHERN TECH. * INDICATES RELOCATED BREAKER
VOLTAGE: 240V/120	MODEL NUMBER: N2 101-W01
MAIN BREAKER: 200 AMP	PHASE: 1
MOUNT: PLATFORM	BUSS RATING: 200 AMPS
ENCLOSURE TYPE: NEMA 3R	NEUTRAL BAR: YES
PANEL STATUS: EXISTING	N TO GROUND BOND: NO
	INTERNAL TVSS: YES
	WIRE: 3
	A/C: NO
	GROUND BAR: YES

CKT	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLES	STATUS	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	LOAD DESCRIPTION	CKT
1	BTS	100	2	ON	ON	2	60	SURGE PRO	2
3									4
5	LIGHTS	20	1	ON	NEW	2	100	SAMSUNG MMBS	6
7	SAMSUNG BBU	15	2	NEW					8
9					ON	1	15	GFCI	10
11	TELCO FAN	10	1	OFF	N/A	BLANK	N/A	AVAILABLE	12
13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14
15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16
17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18
19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20
21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22
23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24
25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	26
27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	28
29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	30
31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	32
33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	34
35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36
37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	38
39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40
41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	42

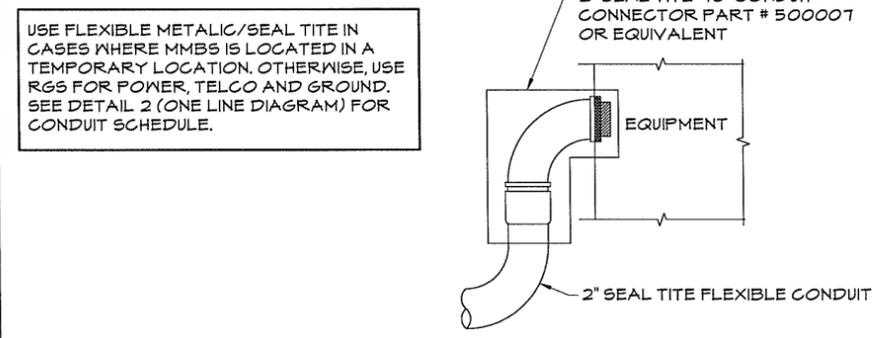
NOTES:  
GENERAL CONTRACTOR TO CHECK REQUIREMENTS WITH LOCAL POWER COMPANY AND JURISDICTION. ADDITIONAL SUB PANEL OFF THE PPC CABINET MIGHT BE REQUIRED TO FEED NEW NETWORK VISION EQUIPMENT.

**3 PANEL SCHEDULE**



**4 TYPICAL EQUIPMENT POWER CONDUIT CONNECTIONS**

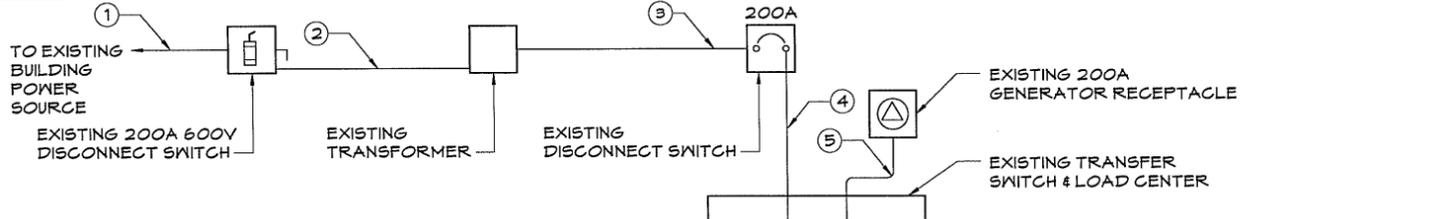
SCALE: NTS



**5 SEAL TITE CONDUIT CONNECTION**

SCALE: NTS

**1 ELECTRICAL NOTES**



CIRCUIT SCHEDULE			
NO	FROM	TO	CONFIGURATION
1	SOURCE	EXISTING 200A 600V DISCONNECT SWITCH	EXISTING
2	EXISTING 100A DISCONNECT SWITCH	EXISTING TRANSFORMER	EXISTING
3	EXISTING TRANSFORMER	EXISTING 200A DISCONNECT SWITCH	EXISTING
4	EXISTING 200A DISCONNECT SWITCH	DISCONNECT SWITCH NORMAL POWER	EXISTING
5	DISCONNECT SWITCH GENERATOR POWER	GENERATOR RECEPTACLE	EXISTING
6	LOAD CENTER	MMBS CABINET	3#2 AWG, 1#8 GND (TYPE THWN) 2" PVC SCH 80 CONDUIT BELOW GRADE - 2" RGS ABOVE GRADE
7	LOAD CENTER	BBU CABINET	3#10 AWG, 1#10 GND (TYPE THWN) 1" PVC SCH 80 CONDUIT BELOW GRADE - 1" RGS ABOVE GRADE

**2 ELECTRICAL ONE-LINE DIAGRAM**



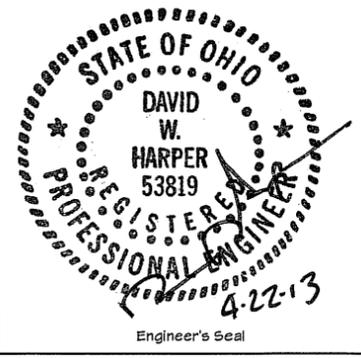
**GENERAL DYNAMICS**  
Wireless Services

**HARPER ENGINEERING, INC.**  
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Phone: (216)344-3855  
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**DRAWING REVISIONS**

Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
0	For Construction	04/22/13	DWH



NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE

CB33XC 147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:

**ONE-LINE DIAGRAM & POWER PANEL SCHEDULE**

SHEET No./Rev.:	SCALE: AS NOTED
	DRWN. BY: MCM
	CHK'D. BY: MAD
	Date: 02/06/13
	cad file: 12-172-063

**E-1/0**



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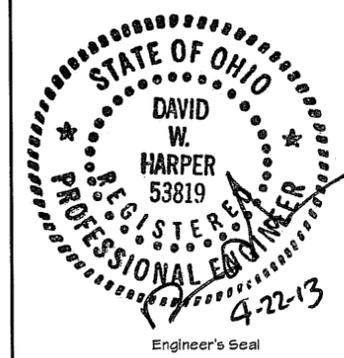
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NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

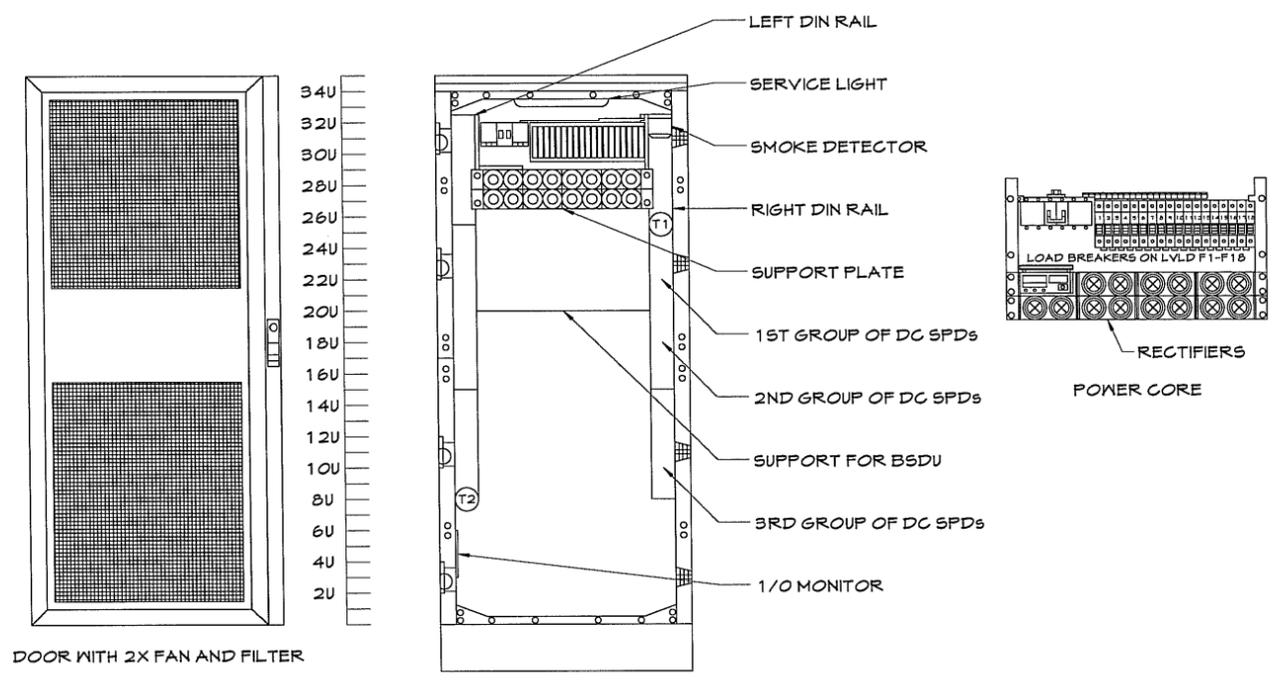
SHEET NAME:

**ELECTRICAL DETAILS**

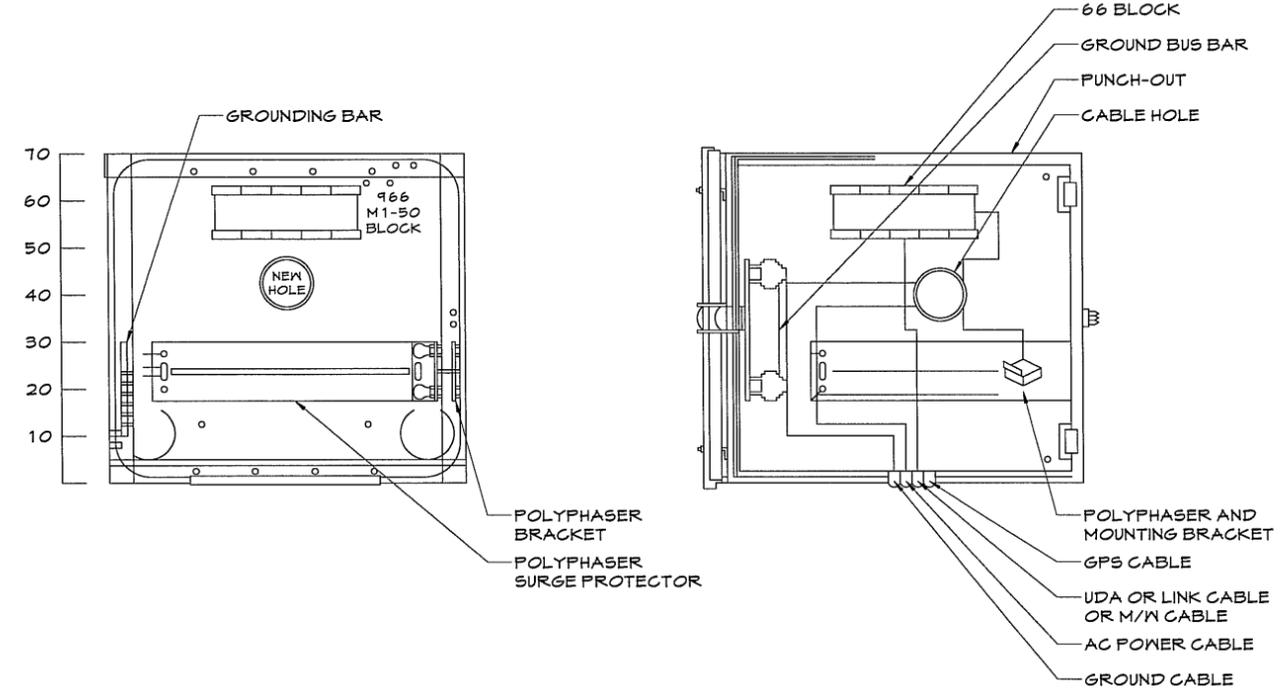
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**E-2/0**

SCALE: AS NOTED  
DRWN. BY: MCM  
CHKD. BY: MAD  
Date: 02/06/13  
cad file: 12-172-063



DOOR WITH 2X FAN AND FILTER

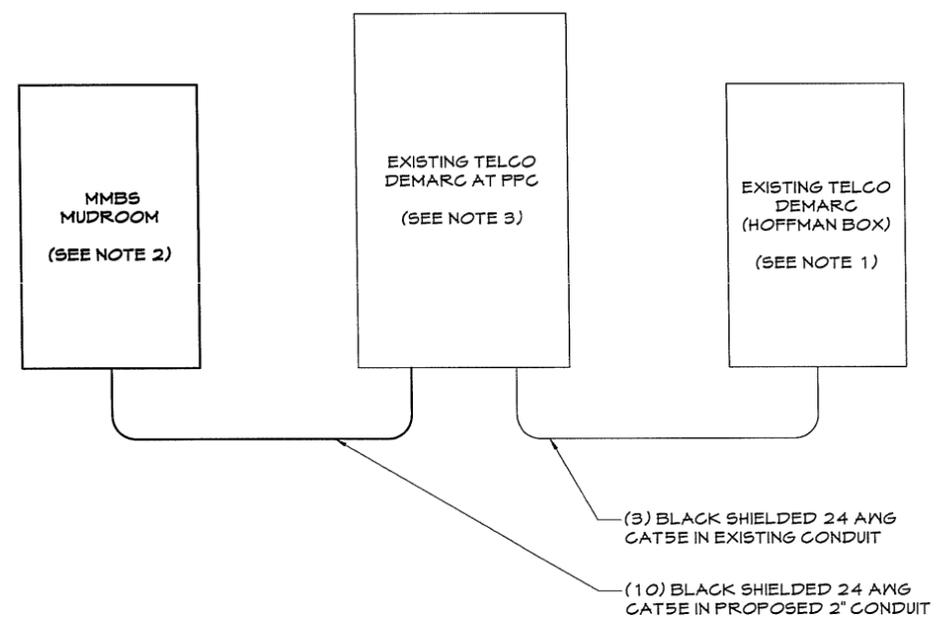


**2 MUDROOM ELECTRICAL DETAIL**

SCALE: NTS

**1 MMBS - ELECTRICAL DETAILS**

SCALE: NTS

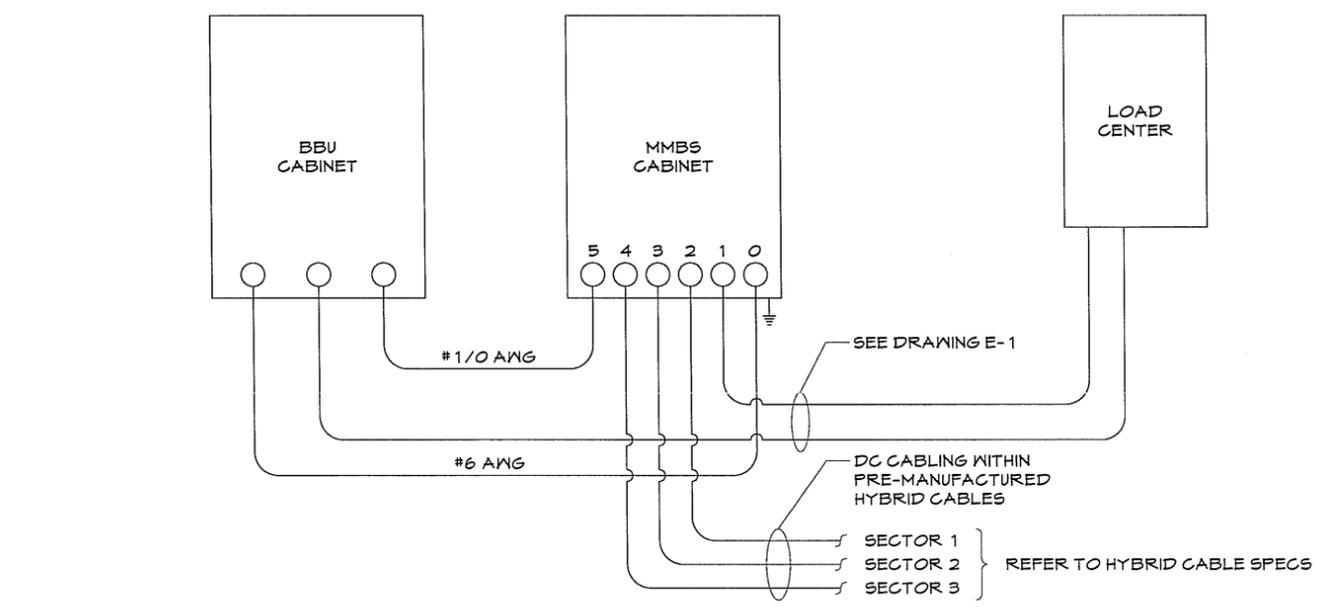


**NOTES:**

- CONTRACTOR TO INSTALL NEW 66 BLOCK IN EXISTING HOFFMAN BOX AT SITE'S MAIN TELCO DEMARC.
- CONTRACTOR SHALL INSTALL RJ-45 ENDS ON ALL (10) RUNS OF CAT5E INTO MMBS MUDROOM.
- CONTRACTOR TO INSTALL NEW 66 BLOCK IN EXISTING TELCO BOX NEXT TO EXISTING PPC CABINET.

**3 TELCO RISER DETAIL**

SCALE: NTS



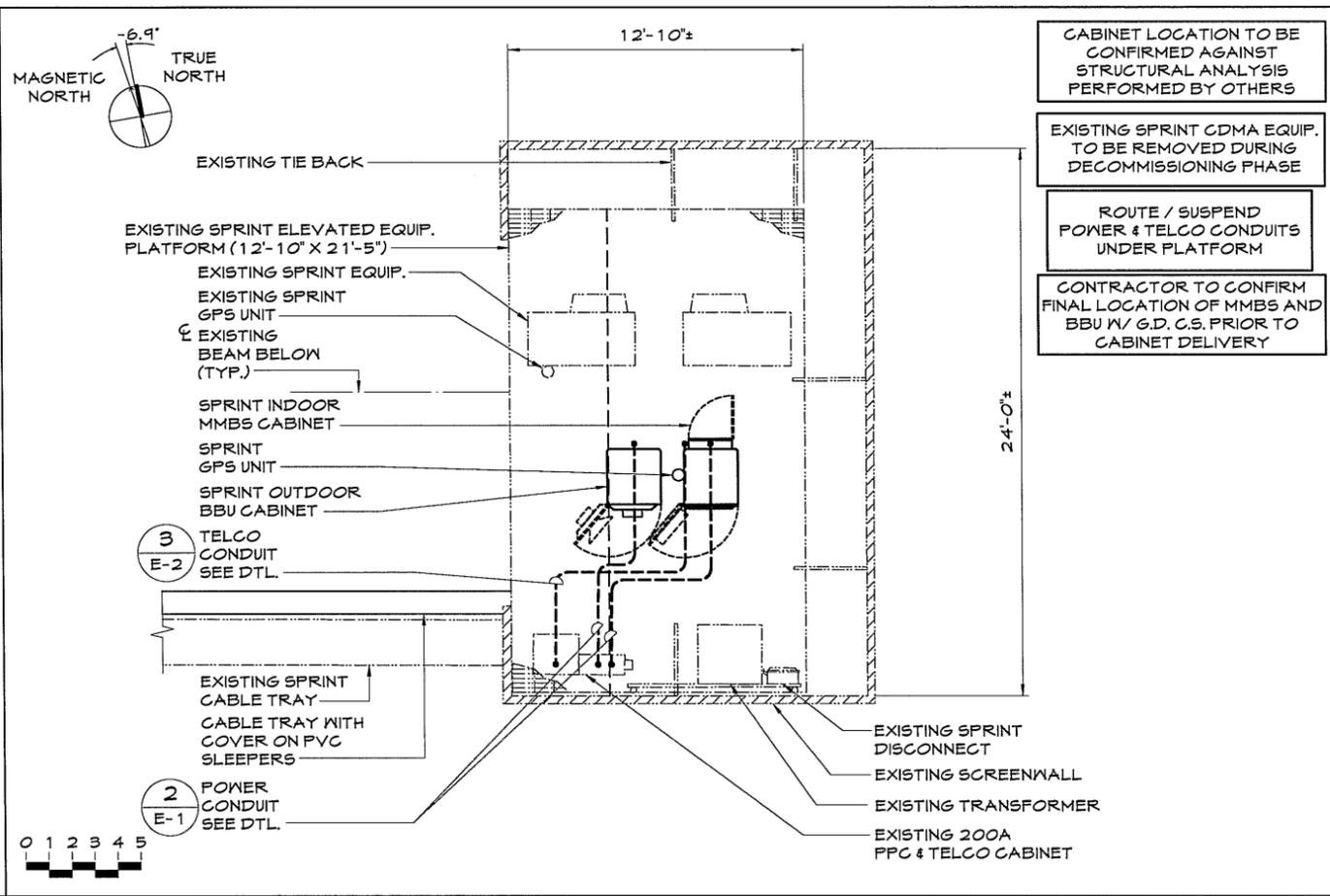
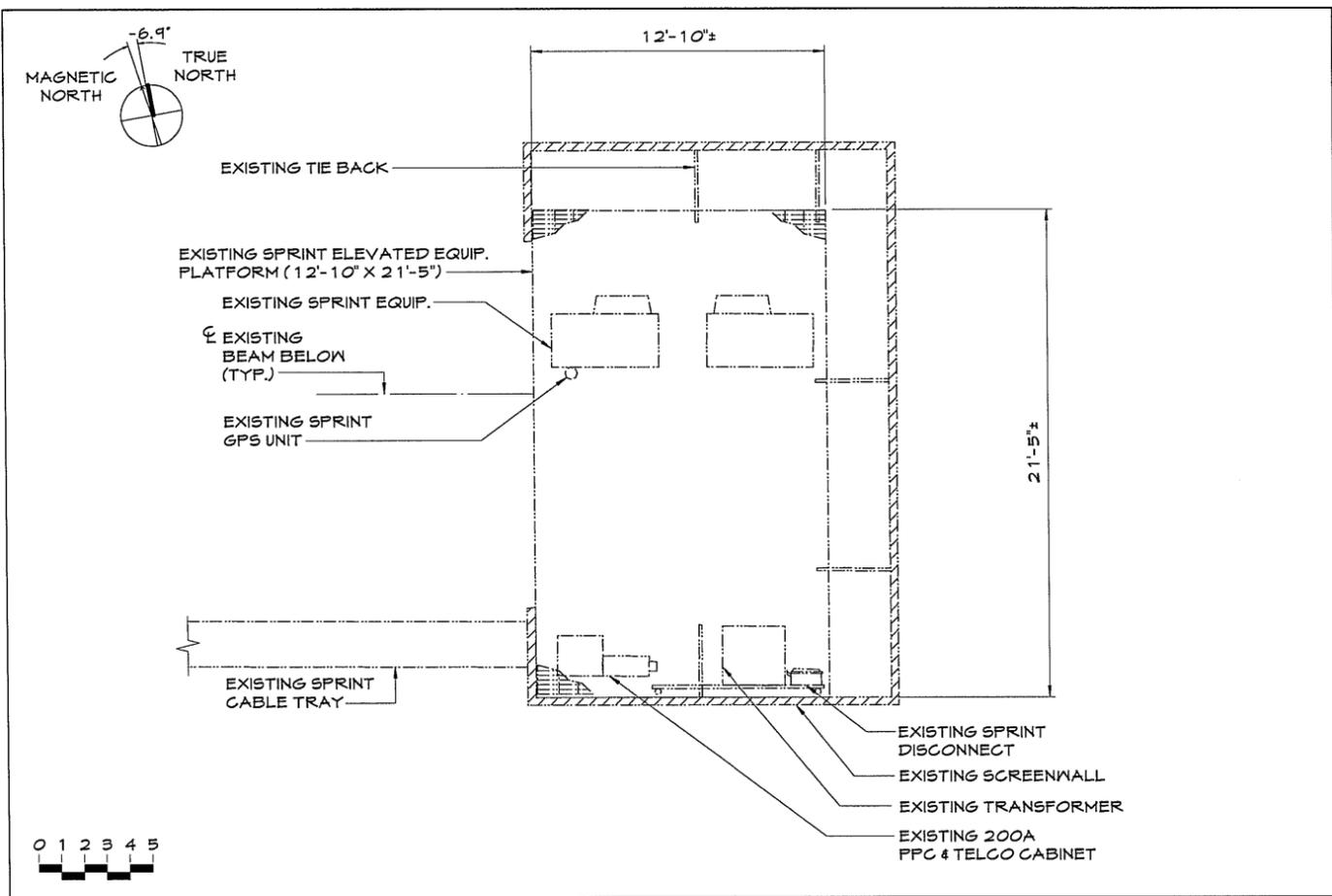
**DC POWER ELECTRICAL NOTES:**

MINIMUM CABLE LENGTH BETWEEN THE O/U AND BATTERY IS 70MM (2.75 IN)  
MAXIMUM CABLE LENGTH DISTANCE IS 900MM (35.43 IN)  
WEATHER PROOFING SHALL INCORPORATE PPC WEATHERPROOFING TAPE KIT, COLD SHRINK SHALL NOT BE USED.  
ROUTE DC CONDUCTORS IN CONDUITS TO NEW MMBS CABINET 48VDC POWER DISTRIBUTION PANEL TO AND FROM NEW BBU CABINET.  
-48 VDC CABLES BETWEEN NEW MMBS CABINET AND RRU'S ARE FACTORY ASSEMBLED AND EQUIPPED WITH ONE PRE-TERMINATED END.  
ALL FIELD INSTALLED DC CABLING SHALL BE TYPE RHH/RHW AND SHALL BE UL THERMOSET INSULATED.

MMBS PORT LAYOUT	
CONDUIT #	USAGE
0	BATTERY
1	AC/GROUND
2	RRU SECTOR 1
3	RRU SECTOR 2
4	RRU SECTOR 3
5	BATTERY

**4 DC POWER DIAGRAM**

SCALE: NTS



CABINET LOCATION TO BE CONFIRMED AGAINST STRUCTURAL ANALYSIS PERFORMED BY OTHERS

EXISTING SPRINT CDMA EQUIP. TO BE REMOVED DURING DECOMMISSIONING PHASE

ROUTE / SUSPEND POWER & TELCO CONDUITS UNDER PLATFORM

CONTRACTOR TO CONFIRM FINAL LOCATION OF MMBS AND BBU W/ G.D. C.S. PRIOR TO CABINET DELIVERY

**Sprint**

6550 SPRINT PARKWAY  
OVERLAND PARK, KS 66251  
PHONE: (913) 762-2000



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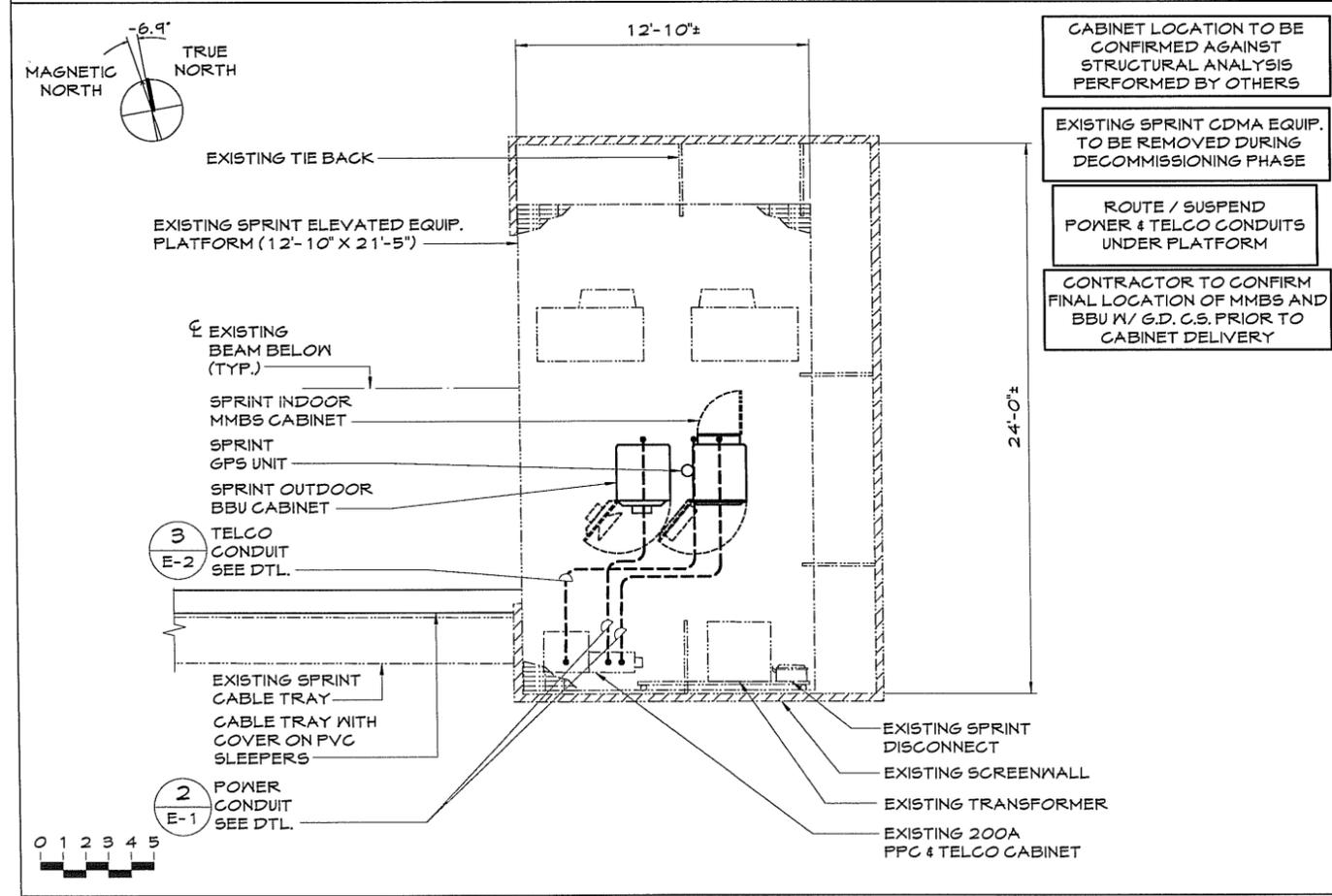
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**1 EQUIPMENT PLAN (EXISTING)**  
SCALE: 1/4" = 1'-0"

**2 EQUIPMENT PLAN (INTERIM) IF REQ'D**  
SCALE: 1/4" = 1'-0"



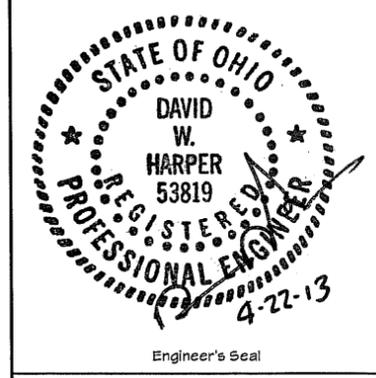
CABINET LOCATION TO BE CONFIRMED AGAINST STRUCTURAL ANALYSIS PERFORMED BY OTHERS

EXISTING SPRINT CDMA EQUIP. TO BE REMOVED DURING DECOMMISSIONING PHASE

ROUTE / SUSPEND POWER & TELCO CONDUITS UNDER PLATFORM

CONTRACTOR TO CONFIRM FINAL LOCATION OF MMBS AND BBU W/ G.D. C.S. PRIOR TO CABINET DELIVERY

FOR GROUNDING PLAN SEE DRAWING E-4



NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

**3 EQUIPMENT PLAN (FINAL)**  
SCALE: 1/4" = 1'-0"

SHEET NAME:  
**POWER & TELCO ROUTING**

SHEET No./Rev.:  
**E-3/0**

SCALE: AS NOTED  
DRWN. BY: MCM  
CHKD. BY: MAD  
Date: 02/06/13  
cad file: 12-172-063

**ANTENNA SECTOR 1**

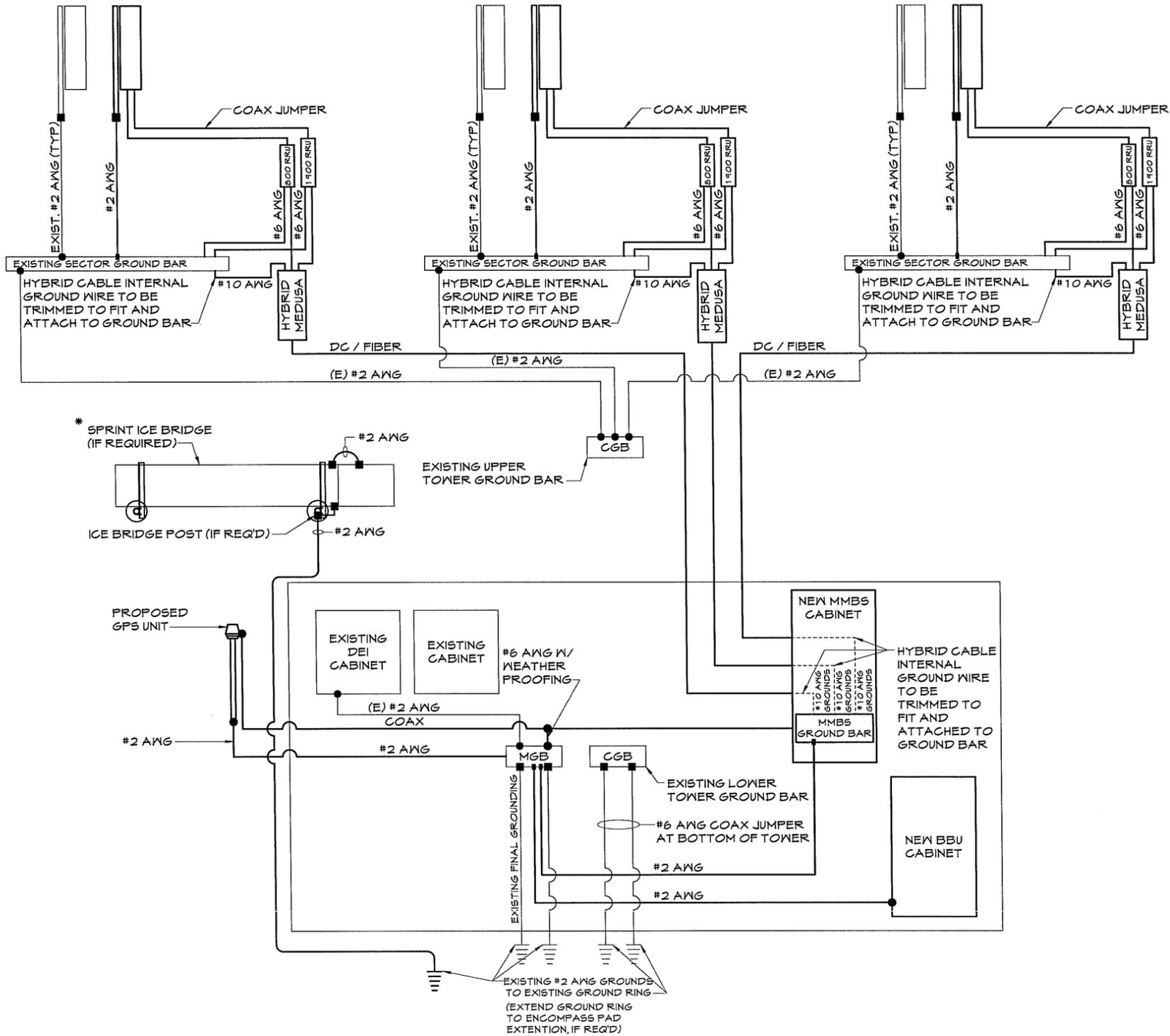
EXISTING SPRINT ANTENNA 800/1900 MHz SPRINT ANTENNA

**ANTENNA SECTOR 2**

EXISTING SPRINT ANTENNA 800/1900 MHz SPRINT ANTENNA

**ANTENNA SECTOR 3**

EXISTING SPRINT ANTENNA 800/1900 MHz SPRINT ANTENNA



LEGEND	
■	EXOTHERMIC CONNECTION
●	MECHANICAL CONNECTION
CGB	ANTENNA GROUND BAR
MGB	MASTER GROUND BAR

**NOTE:**  
1. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED.

**GENERAL GROUNDING NOTES:**

1. ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL INSTALLATION AND CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS.
2. GROUND ALL ANTENNA BASES, FRAMES, CABLE RUNS, AND OTHER METALLIC COMPONENTS USING GROUND WIRES AND CONNECT TO SURFACE MOUNTED BUS BARS. FOLLOW ANTENNA AND BTS MANUFACTURERS PRACTICES FOR GROUNDING REQUIREMENTS. GROUND COAX SHIELD AT BOTH ENDS AND EXIT FROM TOWER OR POLE USING MFR'S PRACTICES.
3. ALL WIRES SHALL BE COPPER THHN/THWN. ALL GROUND WIRE SHALL BE GREEN INSULATED WIRE ABOVE GROUND.
4. CONTRACTOR TO VERIFY AND TEST GROUND TO SOURCE. GROUNDING AND OTHER OPERATIONAL TESTING WILL BE WITNESSED BY SPRINT WIRELESS, LLC. REPRESENTATIVE.
5. REFER TO DIVISION 16 GENERAL ELECTRIC; GENERAL ELECTRICAL PROVISION AND COMPLY WITH ALL REQUIREMENTS OF GROUNDING STANDARDS.
6. ELECTRICAL CONTRACTOR TO PROVIDE DETAILED DESIGN OF GROUNDING SYSTEM PER SPRINT STANDARD GROUNDING METHOD, AND RECEIVE APPROVAL OF DESIGN BY AUTHORIZED SPRINT MOBILITY REPRESENTATIVE, PRIOR TO INSTALLATION OF GROUNDING SYSTEM. PHOTO DOCUMENT ALL EXOTHERMIC AND GROUND RING.
7. NOTIFY CONSTRUCTION MANAGER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS.
8. ALL EXISTING GROUND BARS, WIRES AND CONNECTIONS SHALL BE FIELD VERIFIED. ANY DEFICIENT ITEMS SHALL BE REPLACED AS REQUIRED TO ACHIEVE ADEQUATE GROUNDING REQUIRED BY SPRINT.

**GROUNDING NOTES:**

1. EXOTHERMIC WELDS (2) 2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. EC SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "T") WITH 1" HIGH LETTERS.
3. ALL HARDWARE 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8 INCH DIAMETER OR LARGER.
4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
5. NUT AND WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE. INSTALL BLACK HEAT-SHRINKING TUBE, 600 VOLT INSULATION ON ALL GROUNDING TERMINATIONS. THE INTENT IS TO WEATHERPROOF THE COMPRESSION CONNECTION.
6. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
7. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
8. SUPPLIED AND INSTALLED BY CONTRACTOR.
9. WHEN THE SCOPE OF WORK REQUIRES THE ADDITION OF A GROUNDING BAR TO AN EXISTING TOWER, THE SUBCONTRACTOR SHALL OBTAIN APPROVAL FROM THE TOWER OWNER PRIOR TO MOUNTING THE GROUNDING BAR TO THE TOWER.
10. EXTEND TWO (2) 2 AWG TINNED CU CONDUCTOR FROM BURIED GROUNDING RING AND CONNECT TO THE PROPOSED TOWER. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR GROUNDING CONNECTIONS TO THE TOWER. (APPLICABLE TO NEW TOWERS ONLY)
11. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUNDING BARS AS REQUIRED, PROVIDING 50% SPARE CONNECTION POINTS.
12. EXPOSED GROUND WIRES TO BE NON METALLIC LIQUID TIGHT.
13. ALL GROUNDING CONNECTIONS SHALL BE MADE BY EXOTHERMIC WELDS. EXOTHERMIC WELDS SHALL INCLUDE ALL CABLE TO CABLE, SPLICES, ETC. ALL CABLE TO GROUND RODS, GROUND RODS SPLICES AND LIGHTNING PROTECTIONS SYSTEM AS INDICATED. GROUND FOUNDATION ONLY AS INDICATED BY PM. ALL MATERIALS USED (MOLDS, WELDING, METAL, TOOLS, ETC.) SHALL BE EXOTHERMIC WELDED AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND PROCEDURES. GROUND CONDUCTOR SHALL HAVE A MINIMUM 24" BENDING RADIUS.
14. ALL EXOTHERMIC WELD CONNECTIONS ON GALVANIZED SURFACES SHALL BE CLEANED THOROUGHLY AND COLORED TO MATCH SURFACE WITH (2) TWO COATS OF GALVITE (WHITE) PAINT OR SILVERBRITE (ALUMINUM).
15. ALL ELECTRICAL AND MECHANICAL GROUND CONNECTIONS SHALL HAVE ANTIOXIDANT COMPOUND APPLIED TO CONNECTION.
16. GROUND TESTS SHALL BE PERFORMED AS REQUIRED BY SPRINT STANDARD PROCEDURES. GROUND GRID RESISTANCE SHALL NOT EXCEED 5-OHMS.
17. CONTRACTOR SHALL SUBMIT THE GROUND RESISTANCE TEXT REPORT AS FOLLOW:  
A. ONE (1) COPY TO OWNER REPRESENTATIVE  
B. ONE (1) COPY TO ENGINEER  
C. ONE (1) COPY TO KEEP INSIDE EQUIPMENT INCLOSURE
18. ALL RADIO EQUIPMENT AND UTILITY CABINET GROUND LEADS TO BE #2 AWG STRANDED GREEN JACKETED FROM BUSS TERMINAL.
19. FOR ADDITIONAL GROUNDING NOTES SEE SHEET EO 1.
20. ALL ANTENNA MOUNT GROUNDS SHALL BE #2 AWG STRANDED GREEN JACKETED CABLE GROUNDS SHALL BE BLACK FROM MFR.
21. ALL GROUND WIRES FROM GROUND BARS TO GROUND SHALL BE #2 AWG SOLID BARE AS REQUIRED.
22. ALL ABOVE GROUND WIRES SHALL BE GREEN JACKETED. ALL GROUND WIRES PENETRATING INTO GROUND AND BELOW SHALL BE SOLID BARE.



6550 SPRINT PARKWAY  
OVERLAND PARK, KS 66251  
PHONE: (913) 762-2000



**GENERAL DYNAMICS**  
Wireless Services

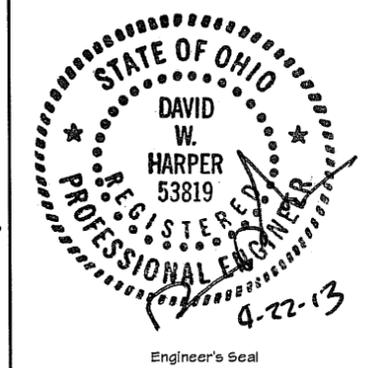
**HARPER ENGINEERING, INC.**  
TELECOM GROUP

815 Superior Ave. Suite 1514  
Cleveland, OH. 44114

Phone: (216)344-3855  
Fax: (216)344-3856

**DRAWING REVISIONS**

Rev.	Description:	Date:	Mgr.
A	For Approval	02/06/13	DWH
0	For Construction	04/22/13	DWH



NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE  
CB33XC147  
425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:  
**GROUNDING DETAILS**

SHEET No./Rev.:	SCALE: AS NOTED
E-4/0	DRWN. BY: MCM
	CHK'D. BY: MAD
	Date: 02/06/13
	cad file: 12-172-065



**GENERAL DYNAMICS**  
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Engineer's Seal

NETWORK VISION MMBS LAUNCH  
(LB-FUNDED) METRO PLACE

CB33XC147

425 METRO PLACE  
DUBLIN, OH 43017  
FRANKLIN COUNTY

SHEET NAME:

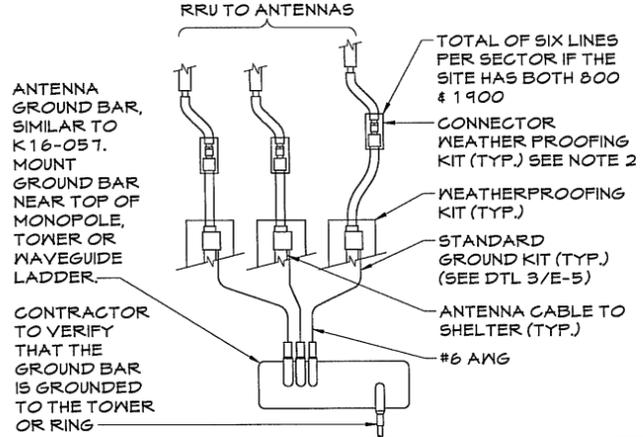
**GROUNDING DETAILS**

SHEET No./Rev.: E-5/0

SCALE: AS NOTED  
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CHK'D. BY: MAD  
Date: 02/06/13  
cad file: 12-112-063

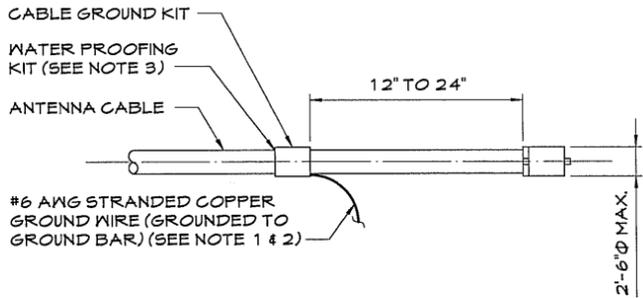
**NOTES:**

- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
- WEATHER PROOFING SHALL BE ANDREWS. (TYPE & PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER)



**1 TYPICAL COAX GROUNDING**

SCALE: N.T.S.

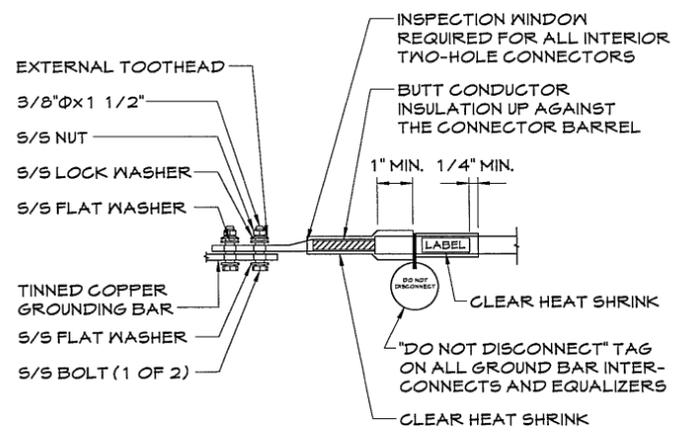


**CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE**

- NOTES:**
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
  - GROUNDING KIT SHALL BE ANDREW SUREGROUND TYPE KIT WITH TWO-HOLE LUG.
  - WEATHER PROOFING SHALL INCORPORATE PPG WEATHER PROOFING TAPE KIT, COLD SHRINK SHALL NOT BE USED.

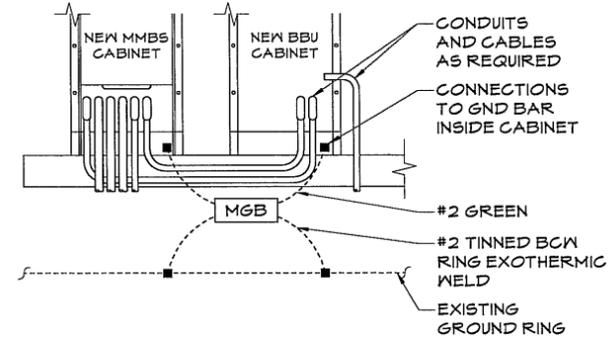
**2 CABLE GROUNDING**

SCALE: N.T.S.



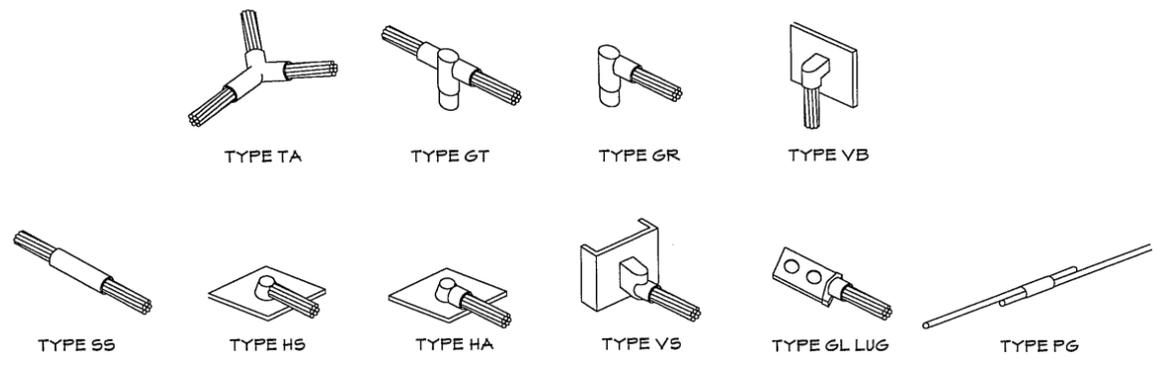
**3 TWO HOLE LUG**

SCALE: N.T.S.



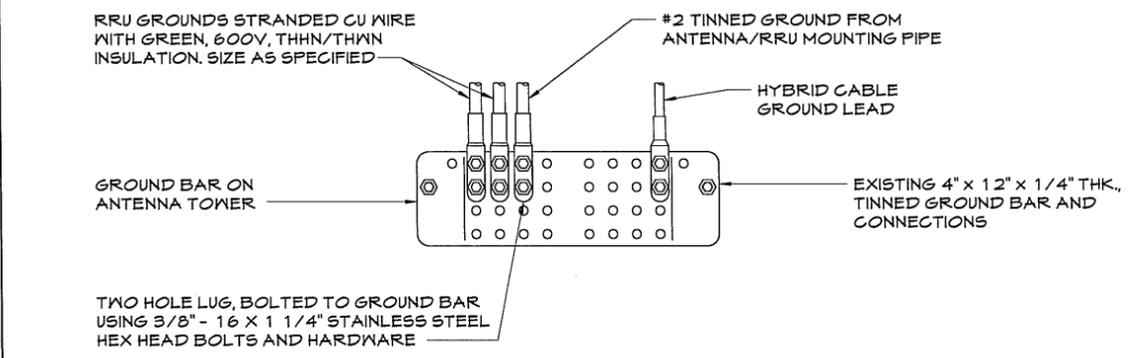
**4 CABINET GROUNDING SCHEMATIC**

SCALE: N.T.S.



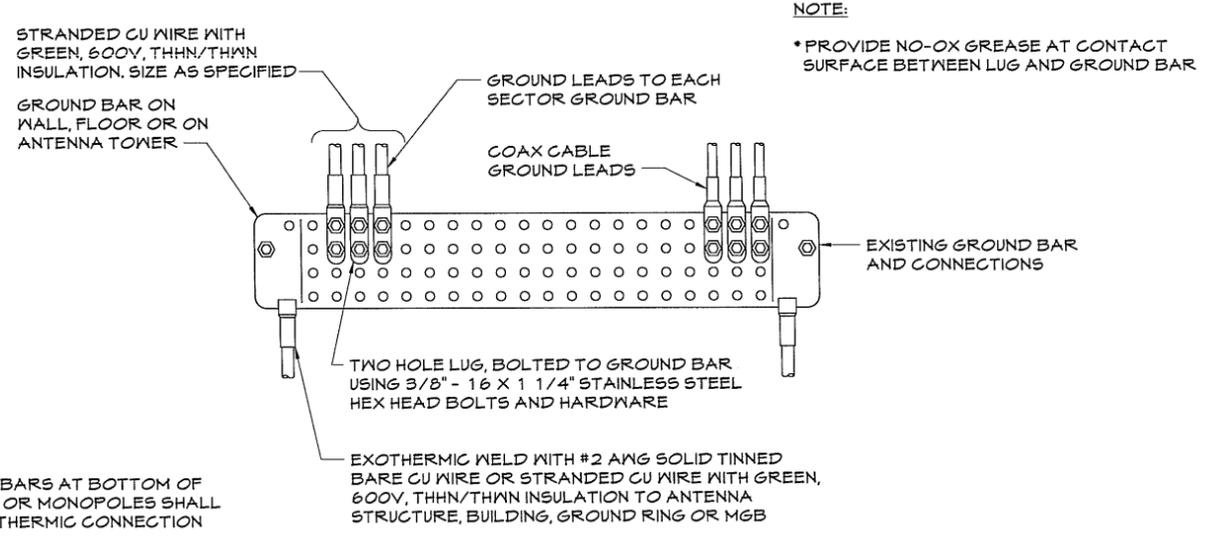
**5 TYPICAL EXOTHERMIC WELD CONNECTIONS**

SCALE: N.T.S.



**6 SECTOR GROUND BAR CONNECTIONS**

SCALE: N.T.S.



**7 TOWER MASTER GROUND BAR CONNECTIONS**

SCALE: N.T.S.

**8 NOT USED**

SCALE: N.T.S.